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PROJECT INFORMATION SHEET

WATER AND WASTEWATER UTILITY INVESTMENTS AND PRICING

PRODUCTS AND ACTIVITIES

THE DRP, WATER AND WASTEWATER UTILITIES, AND THEIR INVESTMENTS, OPERATING COSTS AND PRICING

Reducing nutrient and toxic pollution from municipalities to Danube water bodies is a key objective of the UNDP-GEF Danube Regional Project (DRP). Pollution reduction goes hand in hand with a municipality's or region's capacity to both provide and pay for safe and reliable water supply and wastewater collection and treatment services. In response, the DRP has developed, or will develop, a number of products and activities of use to various stakeholders in the Danube River Basin (DRB).

WHO CAN BENEFIT FROM THE DRP PRODUCTS?

Are you responsible for calculating the consequences of making new investments for a municipal or regional water and wastewater utility (MWWU) in the DRB? Or for deciding on whether such investments should be made? Or are you responsible for developing or implementing policies related to reducing water pollution from DRB municipalities? At the national or municipal level? If yes, then we can help, especially:

- MWWU managers
- National government representatives responsible for developing and implementing policies and legislation related to reducing water pollution from municipalities
- Municipal decision-makers
- Environmental NGOs concerned about water pollution

WHAT ARE THE PRODUCTS AND ACTIVITIES?

1. REPORTS

Report 1 Title: Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin: Volume 1: An Overview of Tariff and Effluent Charge Reform Issues and Proposals.

Summary: A comprehensive overview of the status of municipal drinking water supply and wastewater treatment in seven Danube countries: Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Romania and Slovakia. It assesses the theory and practice of water and wastewater service pricing, and effluent charge designs, as well as proposals for reforming MWWU bookkeeping, financing, management and institutions. It's a valuable handbook for policy-makers, MWWU managers, and municipal decision-makers, or anyone interested in the efficient provision of public water-related services and future MWWU challenges for reaching full-scale effluent reduction.

Report 2 Title: 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.

Summary: This volume consists of three documents for each of the above seven countries (21 documents total) covering water and wastewater systems. The first are national profiles discussing the legal, regulatory, economic and institutional setting of the sector, data about water and wastewater services and service providers, and key policy issues and challenges facing the water and wastewater service sectors of each country. The second document presents a case study covering one particular MWWU in each country, including the results of modelling reform proposals appropriate to that MWWU with the ASTEC model (*see below*). The third document is a summary focusing on the most important issues discussed in the national profile and the case study.

Reports can be found on the DRP website at:
http://www.undp-drp.org/drp/activities_1-6_-7_tariffs_and_charges.html

2. ASTEC

ASTEC is an Excel-based model capable of broadly examining the interaction of an MWWU's service prices with investment strategies, cost structures, customer behaviour and physical conditions. ASTEC has been successfully used in many cases as a decision support tool to test new tariffs designs, investment strategies and corporate changes.

DRP-related products include: (1) ASTEC Model, (2) ASTEC Project Information Sheet and (3) ASTEC User's Guide.

3. REFORM PROPOSALS INFORMATION SHEET

Provides an 'inventory' of a wide range of reforms that MWWUs can apply to streamline operations, cut costs, improve service quality or generate more revenue. Implementation can increase an MWWU's capacity to successfully undertake wastewater treatment investments. Each reform proposal is supplemented with short descriptions. Detailed reviews of the proposals can be found in Volume 1 of the Project Report *(see above)*.

4. IN-COUNTRY DISSEMINATION AND TRAINING WORKSHOPS

Several country-specific workshops were held in 2004-05 to discuss and refine reform proposals and raise awareness of project products and activities, especially the ASTEC model. At least one workshop was held each in Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Romania, Serbia and Montenegro and Slovakia. Participants included MWWU managers, policy-

makers and academics. Additional training and dissemination workshops at the national and international levels are now being planned for 2006-07.

5. CASE STUDIES INFORMATION SHEETS

Brief case studies will present how ASTEC and the reforms were implemented in the project's two demonstration sites at Karlovac, Croatia and Pitesti, Romania.

6. BACKGROUND STORY

This story provides a background and context to reducing water pollution from utilities in the DRB.

7. MEDIA OUTREACH

Related stories have been published in international and national media including:

- 'Danube Watch', the magazine of the International Commission for the Protection of the Danube River (ICPDR): *Paying the price for clean water*
- '7 days', a weekly newspaper in Croatia. *Karlovac is the biggest Croatian polluter of the Danube River*
- 'Voda za Horata' in Bulgaria. *Danube Regional Project: Water and Wastewater Tariffs and Charges*

8. WEBSITE

'Wastewater Tariffs and Charges' section on DRP website with full downloadable reports: http://www.undp-drp.org/drp/activities_1-6_-7_tariffs_and_charges.html

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WATER AND WASTEWATER UTILITY INVESTMENTS & PRICING

Photo: GWP Hungary | Miklos Keresztes

BACKGROUND STORY

THE HEAVY PRICE TAG FOR CLEAN WATER

Cities in the Danube River Basin, especially in central and lower Danube countries, are major sources of wastewater pollution entering local water bodies. EU legislation and local demands are driving them to expand treatment capacity. The related costs are significant, and many utilities need help in making the right price and investment decisions to pay for cleaner water.

Local forces

The 60,000 residents of Karlovac, Croatia, have never been happy about the untreated and stinky human and industrial waste entering the local Mrežnica, Korana and Kupa rivers. It has always upset their local pride. They've never liked how it affects the groundwater sources and shallow wells along the nearby Korana River used to supply part of the city's drinking water, or local swimming, fishing or boating.

"Over the last ten years, some fish and crab have disappeared from the Korana River, my favourite fishing spot," says Ivica Kink, an employee with the local water company. "They are both sensitive to pollution so the wastewater was probably the reason." Karlovac residents wanted something done. The City of Karlovac is trying to bring them solutions.

Besides local demands, the City is aware of other forces driving the need to improve local water quality. "One is that cities downstream from Karlovac aren't pleased about inheriting upstream waste – for example, the Kupa River is the main source of water for the town of Sisak," says Kresimir Veble, a manager at Karlovac's water supply and wastewater treatment utility where he's worked for 27 years.

EU LAWS

Another is a strong set of EU water-related laws that Croatia will need to meet if it wants to join the EU. These include the 'Water Framework Directive' and 'Urban Wastewater Treatment Directive (UWWT)'."

The UWWT is designed to protect the environment from the adverse effects of wastewater from cities and the agro-food industry. "The UWWT is expected to be the most expensive EU water quality requirement to implement," says ICPDR Technical Expert Michaela Popovici. "In Romania, for example, it could account for over 45% of the total costs for complying with EU environmental regulations."

One UWWT requirement is that wastewater treatment should be 'more stringent' in 'sensitive areas' where water bodies are 'eutrophic' – deprived of oxygen and thereby suffocating and reducing biodiversity. 'More stringent' measures could mean introducing, at a utility, 'tertiary treatment' that removes nutrients like nitrogen and phosphorus. Karlovac, now in the process of joining the EU, is expected to be declared a 'sensitive area' and therefore in need of tertiary treatment.

"Because of these factors, Karlovac agreed to build a new wastewater treatment plant that includes tertiary treatment," says Veble. "And the sewer network will also be extended to more households. With significant costs."

Photo: GWP Hungary I Miklos Keresztes

NUTRIENT POLLUTION IN THE DANUBE BASIN

Wastewater from cities like Karlovac is a major cause of nutrient pollution, a serious problem in the Danube River Basin (DRB), notes the ICPDR's 'Danube River Basin Analysis'. So are agriculture and industry. These have led to severe ecological damage in the Black Sea. Large parts of the DRB are at risk of not meeting the objectives of the EU Water Framework Directive because of excess nutrient pollution. Municipal wastewater also causes excessive organic pollution, another key issue identified by the ICPDR.

In response, measures to reduce nutrient and organic pollution will need to be taken by Danube countries through their joint DRB Management Plan, coordinated by the ICPDR. The ICPDR is currently in the process of developing 'Issue Papers' for both nutrient and organic pollution to guide the future programme of measures. An inventory of municipal wastewater treatment plants in the DRB is also now being compiled that will provide information such as location, pollution loads, treatment technologies and cost efficiencies.

"From this data, we will be in a better position to identify the measures needed," says Popovici. "These will include basic measures such as expanding utility capacity and improving technologies, and supplementary measures such as making sure regulations are in place, monitored and enforced. While sufficient wastewater treatment has already been developed in Germany and Austria, major efforts are still required for central and lower Danube countries."

STATE TO CITY

Not long ago, decisions affecting the Karlovac utility were made centrally by the state – typically the case for most former communist states in Central and Eastern Europe (CEE). Now the City decides. Also, the utility needs to cover its own operating costs including the maintenance of infrastructure. It can do that if the prices the utility charges its customers (household and commercial) for providing them with water and wastewater services bring in enough revenues.

If, on top of covering current operating costs, Karlovac now wants to invest in improved services, it will need more funds through grants or loans, possibly from international donors and banks. Loans need to be paid back with interest.

Karlovac will receive a EUR 22.5 million grant from the EC's ISPA fund, a EUR 10 million loan from the European Bank for Reconstruction and Development (EBRD), and a EUR 3.5 million grant from the Government of Croatia for a total investment budget of EUR 36 million. It will roughly be used as follows: water supply EUR 1.5 million; sewers and pump stations for wastewater EUR 14 million; wastewater treatment plant EUR 14 million; and technical assistance and contingency EUR 6.5 million.

"We're involved in a number of water and wastewater projects throughout CEE, having worked at the sub-sovereign level (lending to municipalities and municipal companies) for some time," said Art Schankler, Senior Banker with the EBRD's Municipal and Environmental Infrastructure Team. "If a project meets our criteria, then we'll do our best to provide funding." Criteria include a utility's desire to switch to market economy practices and its ability to repay a loan. EBRD interest rates are comparable to the general market. Lending is not subsidized.

The extra costs of financing will then be passed on to the utility's customers which usually means price increases are needed to ensure greater revenue flows – not great news for customers.

CUTTING COSTS

Planning the design of the new infrastructure and equipment is one difficult part – especially as the EC requires design completion by the end of 2006. This is also the first time a Croatian utility has built a new plant that includes tertiary treatment, so there is no precedent. As engineers, Kresimir and his colleagues are prepared for this task. However, as they're not really economists or financial experts, an even tougher part for them might be deciding on how to pay for the improvements.

"The first step is for utility managers to take a good honest look at their true current costs and where they might be losing money now," says Andras Kis, a consultant working on the 'Tariffs and Charges Project' of the UNDP-GEF Danube Regional Project (DRP). "Things like losing water through leaky pipes or employing an oversized workforce."

Reducing internal costs through a number of reforms, such as reducing leakage from old pipelines, could lead to more available money for investing in improvements. Usually, there are many opportunities for utilities in the DRB to improve efficiencies.

The EBRD's Financial and Operational Performance Improvement Program (FOPIP) will be assisting Karlovac to improve internal cost efficiencies. "The rationale for this program is to reduce the risks of their not being able to repay the loan," says Schankler. "By making operations as efficient as possible, for example through improved bill collections, costs will be lowered, service will improve and prices will also be more affordable."

Eliminating the big differences between prices charged to commercial and household customers is another EBRD goal. "Household prices were typically lower because it was easier politically to charge companies more," says Schankler. "This practice should be eliminated because it raises the cost of doing business above the true costs of providing the service." EBRD provided Karlovac with a 10-year time frame to eliminate differences, while allowing that some differences could be justified (e.g. higher treatment costs for commercial wastewater). "The rationale is that businesses, to be economically viable, should pay market prices. In the long and short run, this benefits everyone."

DECIDING ON A PRICE

The next step is to determine how Karlovac will cover the added costs of financing the new investments for tertiary treatment and sewer network extension. What new reforms will need to be taken? What will be the end service price charged to consumers?

Photo: Victor Mello

This is very complicated given that there is a broad range of different and simultaneous considerations affecting decisions. For example, after a new tertiary treatment facility is built, the costs to operate the overall utility will most likely increase. Another possibility is that if the utility charges its customers higher service prices in the future, they could respond by using less services which would reduce overall revenues.

"What if new customers are added to the sewer network?" asks Veble. "What if effluent charges paid to the government drop? How will the structure and timing for paying back the loan affect pricing? What if the national currency exchange rate changes?"

Seeing that people like Kresimir and his colleagues lacked the necessary 'financial modelling' tools to assess these complex considerations, Karlovac was selected as a demonstration site for the DRP project.

Pitesti in Romania is another pilot site. The project raises awareness among utility managers about possible reforms for improving operational effectiveness. It has also developed a mathematical tool named 'ASTEC' to test the impacts of a range of simultaneous considerations on pricing."At the start, we input existing cost and revenue data from Karlovac into ASTEC," said Kis. "One quick lesson learned was that the data was not ideal and improvements would need to be made, for example on data about unpaid bills. In that respect, the trial was educational. It was also useful to show utility managers how the process works and what the model is capable of outputting."

"Using a tool like ASTEC could benefit the Karlovac utility," says Schankler. "Karlovac will be required by the EBRD to make five-year projections of costs and tariffs, so whatever assistance they could get here would be good. The model could also help with eliminating differences between commercial and household prices."

What does the future hold? "Once Karlovac identifies and selects the potential measures and reforms it might implement, then these can be fed into ASTEC," says Kis. "ASTEC will then give them a range of various prices they can charge consumers for future services." Hopefully, prices that consumers can afford.

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TEST CASE: PITESTI, ROMANIA

A few years ago in Pitesti, Romania, the manager of the nearby Dacia car factory, Mr. Gelu Mujea, complained to the city's mayor about the poor quality of local drinking water. The millions of residents of Bucharest, Romania's capital downstream, also disapproved of Pitesti's dirty water coming their way. Eventually, Pitesti's mayor suggested to Mr. Mujea that he take over the city's recently "localized" local water service company 'Apa Canal Pitesti' and try to solve it himself. Mr. Mujea took on the challenge, was appointed as General Manager of the company, and started on the long road to reform.

He soon introduced cost-saving measures such as automating treatment processes and reducing water use through the broad installation of water meters. He also took steps to increase revenues by improving the collection of bills and increasing prices. The savings and new revenues were used towards technological improvements for the drinking water treatment plant and water network. Pitesti now has both better quality water and more reliable water service.

Mr. Mujea, his staff and City Council then decided to apply for an EU ISPA grant and to take out a loan from the European Investment Bank (EIB) – to extend the city's sewer network, rehabilitate and upgrade the wastewater treatment plant, and further improve the drinking water facility. The new investments will be constructed by 2009.

To assist with financial planning, staff are now using the 'ASTEC' model provided by the UNDP-GEF Danube Regional Project (DRP). Apa Canal Pitesti is one of two DRP demonstration sites. Together with DRP consultants, staff are using ASTEC to model the consequences of an array of expected changes, to come up with different price and investment scenarios. For example, electricity use in some pumping operations is expected to decline significantly due to redesign, renovation and more efficient equipment. And more customers will be tapping into the water and wastewater networks.

Apa Canal Pitesti plans to extend its water and wastewater services to other settlements in the County of Arges, in which Pitesti is the capital city, after Romania joins the EU. To do so, they hope to secure EU Cohesion Funds supplemented by a loan from the EBRD.

"There are many opportunities to get international assistance to improve local services," says Mr. Mujea. "We're doing everything we can to take advantage of them."

Photo: GWP Hungary I Miklos Keresztes

CASE STUDY: BELGRADE

About 1.5 million people live in Belgrade, Serbia's capital city. All of the city's wastewater is discharged into the local Sava and Danube rivers. Some local industries, however, have their own wastewater treatment facilities, expected to meet local regulations and standards for discharging into Belgrade's sewer system.

"On average, the flow of the Danube in Belgrade is between five to six thousand cubic meters per second," says Vladimir Tausanovic, Managing Director for Belgrade Waterworks and Sewerage. "The Danube is a strong recipient of Belgrade's wastewater and there is therefore no significant environmental impact on river water quality." After Belgrade, the Danube flows east and approaches the Romanian border and Iron Gates dams, increasing sediment volumes in the dam reservoir. The quality of water in the reservoir before the dam is below that of the water after the dam leaving Serbia towards the Black Sea.

A wastewater treatment was planned 30 years ago for Belgrade. According to the Belgrade Sewerage Master Plan, costs could reach more than half a billion euro. The City's Development Department recently prepared a new Sewerage Master Plan in accordance with changes to the City's new Urban Master Plan and forecast urban population numbers. Per capita consumption of water has also decreased in Belgrade, partially through the reduction of water losses and higher prices.

The new Sewerage Plan calls for new monitoring systems, extending treatment services to municipalities without sewerage, and completion of the entire network of collectors, interceptors, pumping stations and treatment plants. One large central and four smaller treatment plants are envisioned. Only the plant planned for the settlement of Ostruznica, upstream from Belgrade's water source, will include tertiary treatment – geared mainly to removing nutrient pollution.

"Since 2000, rehabilitation of the water supply and sanitation system, international development cooperation and institutional strengthening projects have all contributed to the success of improving services and decreasing costs in Belgrade," says Tausanovic. The European Agency for Reconstruction supported a Study on Water and Sanitation Improvement in Belgrade. It discusses an open spectrum of public-private partnership possibilities but has not yet suggested a particular approach or solution.

Photo: Victor Mello

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PROJECT INFORMATION SHEET

WATER AND WASTEWATER UTILITY INVESTMENTS AND PRICING

PRODUCTS AND ACTIVITIES: REPORTS

1. ASSESSMENT AND DEVELOPMENT OF MUNICIPAL WATER AND WASTEWATER TARIFFS AND EFFLUENT CHARGES IN THE DRB

REPORT TITLE

Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin: **Volume 1:** An Overview of Tariff and Effluent Charge Reform Issues and Proposals

REPORT SUMMARY

A comprehensive overview of the status of municipal drinking water supply and wastewater treatment in seven Danube countries: Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Romania and Slovakia. It assesses the theory and practice of water and wastewater service pricing, and effluent charge designs, as well as proposals for reforming MWWU bookkeeping, financing, management and institutions. It's a valuable handbook for policy-makers, MWWU managers, and municipal decision-makers, or anyone interested in the efficient provision of public water-related services and future MWWU challenges for reaching full-scale effluent reduction.

REPORT TITLE

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.

REPORT SUMMARY

This volume consists of three documents for each of the above seven countries (21 documents total) covering water and wastewater systems. The first are national profiles discussing the legal, regulatory, economic and institutional setting of the sector, data about water and wastewater services and service providers, and key policy issues and challenges facing the water and wastewater service sectors of each country. The second document presents a case study covering one particular MWWU in each country, including the results of modelling reform proposals appropriate to that MWWU with the ASTEC model (*see below*). The third document is a summary focusing on the most important issues discussed in the national profile and the case study.

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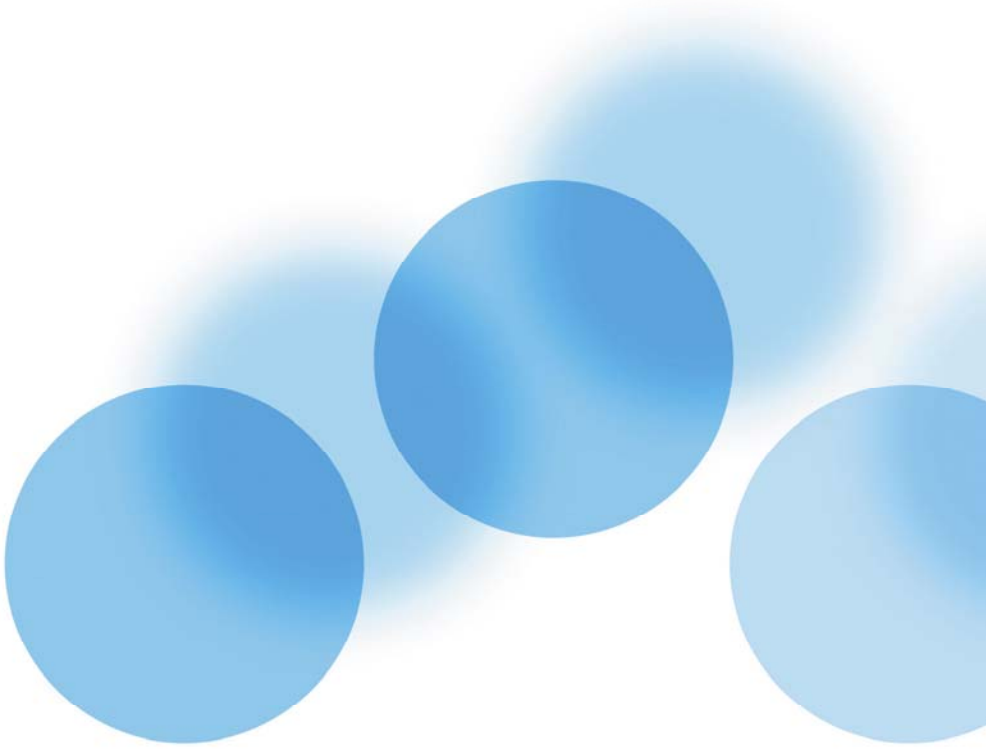

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PROJECT INFORMATION SHEET

WATER AND WASTEWATER UTILITY INVESTMENTS AND PRICING

PRODUCTS AND ACTIVITIES

ASTEC AND WATER SYSTEM PLANNING

CHALLENGES FACING LOCAL AND REGIONAL WATER SYSTEMS

The regulatory, economic and institutional environment of local and regional water systems[1] in Central and Eastern Europe (CEE) is undergoing substantial change. Water systems in the region have to:

- respond to new or redesigned environmental regulations such as standards, effluent charges[2] and fines
- comply with revised and extended supervision of tariff[3] setting, tariff design and cost recovery
- serve a market which is much more uncertain and erratic than it used to be

Meanwhile, operating and investment subsidies formerly provided by the central government are being eliminated or sharply curtailed. Those external sources that remain, whether domestic or international, are subject to new and often far-reaching restrictions. In parallel with these changes, the ownership of assets and service responsibilities have been, or are being, transferred from the central government to local levels. In some cases, private participation in the operation or ownership of water systems has become an option. In short, water systems are currently beset by a variety of interconnected technical, economic and organizational challenges.

[1] "Water systems" here refer to those public utilities that provide continuous water and/or wastewater service to residents and commercial businesses in a municipality and, sometimes, adjacent communities using networks of pipes.

[2] "Effluent charges" are fees assessed on water systems by regulators for discharging effluent from the wastewater network into water bodies.

[3] "Tariff" is the traditional British term for the price approved by public regulators for use by public utilities such as water systems.

ASTEC'S ROLE

Water systems must respond to these new challenges and opportunities by adopting a variety of new policies and strategies. Unfortunately, many water systems currently lack the data and tools to properly assess the consequences of measures undertaken in this new environment. This is why the 'Accounts Simulation for Tariffs and Effluent Charges (ASTEC) Model' was developed. ASTEC is an Excel-based model capable of broadly examining the interaction of a water system's tariffs and effluent charges with investment strategies, cost structures, customer behaviour and physical conditions.

ASTEC'S STRUCTURE

The model is organized around groups of customers, or 'service users'. The main features of each service user group are characterized by input data such as: the number of accounts; average annual water consumption and annual discharge of wastewater per account; tariff structure and tariff levels; and elasticity of demand for services. Revenues from tariffs are computed-based on these inputs. Additional revenues, such as from non-core services, grants or subsidies, can also be supplied as inputs to ASTEC.

Cost data within the model are organized around the service (water or wastewater) as well as the nature of the cost -- fixed costs, and unit or variable cost that vary with the amount of water produced or wastewater treated. The design and level of effluent charges is also one type of cost input for the model. Moreover, ASTEC offers several methods for allocating each and every cost item among the service users, making it possible to compute the cost of providing service for each service user group. These can be compared with the revenues obtained from the service users and adjusted to reflect the water system's policy regarding the principle of 'full-cost pricing'.

ASTEC'S APPLICATIONS

While water and wastewater tariffs can be supplied to the model at the outset, ASTEC can also be asked to compute a set of tariffs that recovers all costs. This can be done for customers as a whole or for each service user group. Furthermore, the tariffs computed can reflect a variety of designs, for example, either as a simple variable tariff or commodity charge, or as a multi-part tariff with a fixed charge (e.g. monthly). While computing new tariff levels, ASTEC simultaneously calculates new levels of consumption as customers react to tariff changes.

These features make it possible to investigate the consequences of different operating policies and development strategies on physical flows (e.g. system leakage) and financial accounts. It is possible to investigate what happens if cross-financing between industrial and households consumers is ended; to estimate the tariff consequences of a new investment with and without supporting grants; or to identify the most cost-effective strategy for dealing with a newly-introduced effluent charge regulation.

ASTEC has been implemented and used to examine various investment and tariff policy changes for seven CEE water systems over the past three years. In several cases, ASTEC modelled the implications of major changes to investment, tariffs and operating policies. This experience has demonstrated that ASTEC is a powerful tool for municipal water and wastewater (MWWU)

managers, municipal decision-makers and policy makers alike.[4] An updated and more powerful version of the model that allows the user to monitor up to fifteen different service user groups is presently available.

ASTEC'S COST

ASTEC was developed by Glenn Morris and Andras Kis within the UNDP/GEF Danube Regional Project (DRP). ASTEC is public domain software and neither its developers nor the DRP charge for its use.[5] The only absolute requirement is that the ASTEC users have a recent version of Microsoft Excel installed on a modern computer.

At the same time, experience shows that using the model correctly and effectively usually requires a substantial commitment of staff time and water system resources. Ideally, the staff involved should have some understanding of English, spreadsheet models and economics and finance principles. While there is an 'ASTEC Users Guide', as well as detailed comments and alerts in the ASTEC spreadsheets themselves, prospective users are urged to obtain both introductory and periodic assistance from an experienced user. The biggest potential cost probably lies in misapplication of ASTEC or misunderstanding its output.

See more on the Municipal Water Supply and Wastewater section on the DRP website at:
www.undp-drp.org/drp/themes_municipal-ws-ww.html

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[4] This experience is elaborated in a short paper by Morris and Kis, 'ASTEC: A Tool for Water System Discovery', available from the authors or on the DRP website.

[5] Neither ASTEC's developers nor sponsors warrantee the software or promise to support the software beyond DRP-related applications in which they have been involved.

PROJECT INFORMATION SHEET

WATER AND WASTEWATER UTILITY INVESTMENTS AND PRICING

PRODUCTS AND ACTIVITIES

REFORM PROPOSALS

INTRODUCTION

Reducing nutrient and toxic pollution from municipalities to Danube water bodies is a key objective of the UNDP-GEF Danube Regional Project (DRP), and one of the goals of regional and municipal water and wastewater utilities (MWWUs) in the Danube River Basin (DRB). Other MWWU goals include the provision of good quality water, reliable service, and the proper collection and treatment of wastewater. However, many MWWUs do not have the necessary resources to carry out large-scale investments to attain some of these goals. They must therefore set priorities, and the advanced treatment of wastewater frequently enjoys a lower priority than do the other goals.

Major pollution reduction initiatives will only be successful if they are preceded or accompanied by a series of reforms at the MWWU resulting in more efficient operations, including cost savings, carefully considered revisions in tariff levels and structures, and attractive and dependable service levels. Reforms may be needed even when a wastewater investment is partly paid for by national or EU financial assistance programs, since the other part of the investment still has to be financed by the MWWU, and associated operating costs – all of which are typically the responsibility of the MWWU -- are likely to rise.

This information sheet offers an "inventory" of reforms that – according to experience in both developed and transitional economies -- can substantially increase the capacity of MWWUs to pursue multiple strategic objectives, including advanced wastewater treatment.

Reforms are organized into two groups: pricing (or 'tariff' reforms), and administrative and technical reforms. It is important to keep in mind, however, that these reforms will frequently reinforce each other, and full realization of the benefits of any specific reform often depends on the effective implementation of other reforms. Finally, not all reforms apply to all MWWUs equally, as some may find one group of reforms more suitable than others.

PRICING REFORMS

1. SET FULL COST-RECOVERING PRICES

Pricing water and wastewater services to recover the full cost of providing those services is important both to support sustainable water and wastewater services and to ensure efficient resource allocation and conservation. If revenues fall short of costs, then the MWWU will eventually have to reduce the quality of its services since it will not be able to finance repair, maintenance and replacement of the existing infrastructure, and in some extreme cases, not even operating costs. When determining the full costs of the MWWU, it is essential to properly value existing infrastructure and take thoughtful account of the real depreciation of infrastructure with its use and over time. Application of cost-recovering prices is especially important before the water system commits to new services or expanded service levels. When prices do not fully reflect the underlying cost of providing the service, then customers will "over-consume", which is not only inefficient and may result in over-exploitation of the water base, but in some cases it may also push the operating cost of the company to higher levels.

2. ESTABLISH COST-REFLECTIVE PRICES

Cost-reflective prices not only reflect the full costs of the MWWU of providing service but also differences in the cost of servicing different customers. These cost differences can result from a wide variety of circumstances such as: the customer's line of business, the effluent produced by the customer, the seasonality of water use or a customer's remote location. Whatever the reason, adjusting a customer's price to reflect the full cost of service is necessary to properly conserve both water and other valuable resources. An ongoing problematic practice in transition economies has been to charge industrial customers more than households. This is probably the situation where prices are still distorted most, resulting in over-consumption by households and under-consumption or a shift to self-supply of water and sewerage services by industry.

3. INTRODUCE MONTHLY CHARGES

Variable prices or tariffs are denominated in monetary units per volume of water (e.g. €/m3). Fixed tariffs are denominated in monetary units per unit of time (e.g. €/month). Since large parts of the costs of municipal water systems are composed of fixed costs, it makes economic and business sense to recover at least some of these costs through use of a fixed tariff and to recover the rest of the costs, including operating costs that vary with the amount of water used, with the variable tariff. Fixed tariffs are also attractive because they can stabilize revenue streams, which is especially important in areas with significant seasonal consumption.

Monthly fixed tariffs may also be justified from an equity perspective, since under a pure variable price scheme service users with low or intermittent consumption may be cross-financed by larger consumers (e.g. weekend or summer home customers use small, periodic volumes of water but impose costs for continuous service).

4. BEWARE OF, AND LIMIT, THE FINANCIAL BURDEN ON CUSTOMERS

Before introducing a new tariff design or a substantial increase in prices, the MWWU must carefully consider the financial viability of the customers. There is not a generally accepted rule-of-thumb figure for acceptable payment as a percentage of income or some other measure. The willingness-to-pay consumers demonstrate varies widely with national, community, firm and household circumstances and the level and type of service involved.

If customers respond by reducing or dropping service, by delaying or refusing payment, or by petitioning public officials for relief, the water system can face grave financial difficulties. Graduality in the increase of tariffs, the introduction of cost-based tariffs, investment planning that balances the demand for various services against the prospective costs, and use of general programs of social protection to assist low-income households with payments for water and wastewater services, can all ease the burden on customers, while protecting the revenue stream of the MWWU.

5. MAKE INDIVIDUAL TAILORED CONTRACTS WITH KEY CUSTOMERS

These agreements set the terms of service, including price levels, for key customers, including municipalities and public institutions. They bind both the water system and the key customer together for an extended period. This protects the customer from unreasonable tariff increases and the water system from pressure to grant preferential tariffs to influential customers, customer defections, or sharp drops in service use. Individual contracts are especially important when a limited number of customers make up a large fraction of overall consumption, and when a drop in their consumption would substantially reduce the revenues of the MWWU.

RELATED ADMINISTRATIVE AND INSTITUTIONAL REFORMS

6. START PUBLIC INFORMATION PROGRAMS

When the customers of the MWWU have a good understanding of the factors driving water and wastewater prices, then they are more likely to accept price increases. A public information program or campaign is especially useful before major investments and related price changes, or new tariff designs such as the introduction of a monthly charge, take place.

7. KEEP GOOD RECORDS

Good record-keeping, in addition to meeting local and international accounting standards, should also be designed to support financial and management systems and decision-making. Ideally, MWWUs should have an in-house data system containing good quality, time series data on a wide range of variables. The data system should include detailed data on customer accounts including consumption, billing and payment information. The cost data of the company should be organized not only according to traditional accounting categories, but also based on 'cost centers' of the company which may be defined according to customer categories, geographical areas served or services provided. Furthermore, the MWWU should carefully distinguish the nature of these costs: operating vs. capital costs, maintenance vs. repair, etc.

A well-maintained data system can provide valuable information for tariff studies, payment-recovery initiatives, demand forecasting, demand management decisions, financial planning and monitoring of the fulfillment of financial plans. Through a set of performance indicators, the data system can also help to measure the effectiveness of management decisions. The bottom line is that the data system should support design and implementation of the various other reforms described here.

8. IMPROVE COLLECTION OF PAYMENTS

The advantage of the improved collection of bills is that the MWWU will get higher revenues and with less delay. In spite of this, many MWWUs do not have a plan of actions to pursue non-payers and late-payers. There are various strategies to improve collection and the MWWU should choose one or more based on local conditions, including the perceived effectiveness of the measures, related costs and technological obstacles. Some examples are shutting off the service, reduced water flow to non-payers, taking cases to court, publicizing the names of non-payers and requiring deposits in advance of providing service.

9. PARTICIPATE IN BENCHMARKING STUDIES

Benchmarking is the systematic measurement and comparison of the same set of indicators across several organizations. An example of an indicator is the labour cost per m3 of delivered water. By comparing your performance with that of other MWWUs, you can identify your strengths as well as your shortcomings, and improve the latter. To improve the performance of your organization, learn from the organization that did best with specific indicators.

10. GET YOUR PERFORMANCE AUDITED

An alternative to benchmarking is to get your performance audited by an independent consultant, and to derive a plan of reforms based on the findings. Performance auditing is not the same as financial auditing for tax purposes. The latter examines whether accounting is properly done and if it properly reflects the operation of the company, especially the costs and revenues. In performance auditing, the emphasis is on the effective operation of the company. Both benchmarking studies and performance audits can set the stage for a reform plan which will reduce costs and/or improve revenues.

11. PROVIDE INCENTIVES FOR GOOD MANAGEMENT

The owner of the MWWU, most frequently the municipality, can provide incentives for the management of the company to encourage reductions in the cost of service and/or improve the quality of service without increasing costs. If the management is effective, and tariffs reflect the cost of service, then these incentives will more than pay for themselves. There are numerous ways to provide incentives. One is to award contracts for management of the MWWU on a competitive basis. The management fee can reflect achievements in improving operating efficiency. Contracts should ensure adequate time for the introduction of reforms and their impacts. Another is to create a compensation package for appointed managers in which one of the factors is meeting performance targets.

12. MEASURE WATER AND WASTEWATER FLOWS AND QUALITY

The measurement of water and wastewater flows in their respective networks, and the metering of consumption, are essential elements of tariff reforms and performance enhancement.

Metering of water use is required for cubic meter-based tariff designs that provide a direct incentive to conserve water resources. Metering also helps assure the customers that they are paying only for the water they use and this greatly aids acceptance of increased tariff levels. This practice extends to retrofitting water meters in apartment buildings.

Measurement of water and wastewater flows helps establish the location and amount of water losses and infiltration and is a key to identifying the most cost-effective investments in the water and wastewater network.

13. INCREMENTAL BUDGETING AND INVESTMENT PLANNING

In order to make good choices on resource allocation including, especially, long term investment planning, activities and projects should be examined in an incremental way and then prioritized. Only when technically independent projects are characterized in this way, and then prioritized for implementation, can we be assured that the cost-effective and, even better, efficient choices are being made. In this way, water systems can determine if a project – even a politically popular project -- is excessively costly. The incremental methodology provides the basis for setting cost-reflective tariffs and the basis for appealing mandated, but excessively costly and burdensome investments.

MORE ON REFORM PROPOSALS

A DRP report (Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin: Volume 1: An Overview of Tariff and Effluent Charge Reform Issues and Proposals) covers many of the reform proposals summarized above in greater detail.

The DABLAS program has issued a report (Best Practice in Water and Wastewater Tariff Setting: Lessons for Water Systems in Transition Economies) that also recommends a set of tariff and institutional practices for further consideration.

DRP developed an Excel-based model called 'ASTEC', capable of broadly examining the interaction of an MWWU's service prices with investment strategies, cost structures, customer behaviour and physical conditions. ASTEC has been successfully used in several cases as a decision support tool to test reforms related to new tariffs designs, investment strategies and corporate changes.

Some of the reforms discussed above have been introduced in two locations: Pitesti, Romania and Karlovac, Croatia. The related experiences, including ASTEC analyses, are summarized in two DRP project reports and an information sheet.

All of these reports and tools are or will shortly be available on the 'Municipal Water Supply and Wastewater' section of the DRP website:
http://www.undp-drp.org/drp/themes_municipal-ws-ww.html

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