

**ERRA/LGI  
TRAINING MATERIAL No. 4**

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**Price Setting and  
Revenue Administration**

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***INFORMATION EXCHANGE AND PEER ASSISTANCE PROGRAM BETWEEN  
LOCAL GOVERNMENT OFFICIALS AND ENERGY REGULATORS***

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***The ERRA/LGI Training Material 4: "Price Setting and Revenue Administration"*** was prepared, along with four other manuals, to support the training of public sector experts, especially at sub-national levels. In compiling the materials we have drawn on ERRA workshop proceedings and the written responses of ERRA members to questionnaires, as well as "Household Water Pricing in OECD Countries"(OECD). Preparing the training materials we used the comments and advises of Robert Archer(United States Agency for International Development), Pál Lángfy (Hungarian Energy Office), and Gábor Péteri (Open Society Institute).

## 1. INTRODUCTION

In most of the countries in the region local authorities have more and more influence on the setting of the price of district heating, water and sewage services. Pricing in an economic sense means the setting of the value of the product (service) on a per unit basis that is used in the settlement between suppliers and consumers of the product (service). In reality, pricing is used in a way that is much broader than this economic definition, as in the region it is not unusual for the quantity of the service not to be susceptible of measurement. In such cases, prices are indirectly related to consumption, thus coming much closer to the condition of benefit taxation.

The institutional setting of the sector has an effect on the pricing mechanism. The legal decision is a key element in pricing. Most of the countries in the region have delegated pricing functions to local government, but the real influence depends on several other things. The price of the service depends very much on the price of inputs, like energy cost. If the energy price is centrally defined, but the local government has the right to define the service price, its freedom could be quite limited. Another example, from Hungary, is that regional water works owned by the central government transfer water for distribution to companies owned by the local government at a price set by the central government. In this case as well, the room for local government is limited.

The procedure of pricing is very important as well. Is it a one-sided decision making process, with no room for possible appeal processes as there were in the pre-transition period. In some countries in the region, the local government units have the right to set the tariff, but it has to be approved by the central government or by the central government agency. There are some cases when the central government gives a subsidy proportional to the tariff to the service provider. In this case, the right of the central government to give or withhold its approval, that is, sharing the responsibility for pricing, is understandable. The service companies need security especially if they make long-term investments, because they can make losses if the service is under-priced. The law defines the procedures or accounting rules which again – depending on how enforceable the laws are - could limit the manoeuvring room for an organisation with price-setting rights.

## 2. CRITERIA FOR EFFICIENT PRICING

If the price of the product is ultimately determined in the market, based upon the agreement of the parties involved in the transaction, and resulting from the interaction (balance) of supply and demand, then the price is considered to be a "free-market price". However, there are some areas of economic activity in which market imperfections exist, such as in the case of natural monopolies. In such cases, the market may fail to yield efficient pricing solutions independently. Intervention by a third party, such as the state regulatory body, may be required in such cases, to establish prices that approximate efficient, competitive outcomes.

The main criteria of for a sensible charging system for public services are the follow ing:

- allocative (economic) efficiency – this means that water services should be provided such that the community's net benefits are maximised. Ideally, this would determine both quantity and quality, and, where the service is priced, it implies that the price should reflect the incremental costs to the community of satisfying marginal costs;
- equity – the constitution of an equitable system of charges with regard to the services received and costs imposed on consumers;
- financial requirements – water undertakings are usually required to raise all of their operating costs and to service all or some of the debt associated with their capital expenditures through their revenue;
- public health – charging systems should not be designed or operated in such a way as to put public health in any significant danger;
- environmental efficiency – the rational use and preservation of the environment requires that all the social costs of providing the water service are reflected in the price;
- consumer acceptability and understanding – the charging system must be comprehensible to consumers and command broad acceptance among them;
- administrative costs – a charging system must not impose large administrative costs on a continuing basis unless there are clear gains to efficiency, equity, revenue generation or the public health.

### 3. PRINCIPLE OF PRICING

Economic literature emphasizes the need for prices to be based on both "economic and environmental efficiency" and "broad (social) equity". First, consider efficiency. The principle of pricing allows district heating and water companies to recover all their costs and to earn a fair profit, which will in turn encourage further development of the companies and efficient and reliable service supply. Another principle of ratemaking for district heating and water services should be that each customer class pays its proportionate share of the total cost for the provision of a service, i.e. gradual elimination of cross-subsidization. This is a primary objective in most countries in the world.

One can recognize both similarities and differences when comparing the tariff structures maintained in the developed countries and in the countries of Eastern Europe and the CIS.

***The tariff systems should perform the following major functions:***

- recovery of prudent costs of providing services and the allowance of a fair return to the district heating company;
- promotion of the district heating and water consumption patterns likely to improve the operation of the service;
- protection of the environment and promotion of conditions for improvements in the ecological sphere;
- motivating customers to optimize capacity utilization in order to reduce the capacity deficit;
- encouraging customers to implement efficiency measures.

There is a broad range of factors that must be considered when estimating the costs of district heating and water services for rate-making purposes in the various countries. In all countries, three principal concepts of rate making are widely accepted:

1. The tariff is calculated based upon the enterprise's revenue requirement, which needs to be established at a level sufficient to provide the entity the opportunity to recover the full costs of operations, including a reasonable return.

The revenue (gross revenue) includes the cash inflow from selling products, services, property, and all other cash and non-cash material earnings, to recover all the production costs and allow for adequate income to pay taxes, dividends (income of the shareholders), finance the rehabilitation and refurbishment of the existing assets and construct new assets (if required).

In almost all countries, the regulation of the revenue requirement is conducted on the basis of special enactment and tariff methodologies.

The revenue requirement includes:

- distribution costs;
- profit expected from sales of the product;
- subsidies and other forms of State support.

The costs of fixed assets are included in the cost of the product through depreciation expenses. In CIS countries the depreciation expense is determined based upon the value of the net fixed assets, because fixed assets are recorded on a net basis in the balance sheet.

However, the accounting of the fixed assets can be carried out on the basis of the revalued fixed assets if this is considered the reasonable value of the fixed assets on the date of the revaluation. A revaluation should be conducted in case the book value differs significantly from the reasonable value of assets on the date of reporting.

### **Box 1. Fixed Assets Accounting in Ukraine**

In Ukraine, in accordance with the accounting standard "Fixed assets" an enterprise is allowed to re-evaluate the fixed assets if there is more than 10% difference between the depreciated value of the fixed asset and its fair market value on the date when the balance sheet is reported. The standard is developed in accordance with International Accounting Standards and is used as a guideline for determination of the depreciation that can be calculated using various methods. The method of depreciation should be chosen in such a way that it provides the most benefits to the enterprise from the asset. The depreciation method is an element of the accounting policy of the enterprise.

The main flaw in this tariff setting approach is that it is aimed at the recovery of the invested assets, but does not fully reflect the needs for the future development of the DH and water sectors. These tariffs are determined at average cost, which does not reflect the non-linear nature of the cost structure as service output increases. Additionally, in an environment of high inflation, the rehabilitation costs for the fixed assets can substantially exceed the depreciation component of the tariff.

2. Time-of-use tariffs (daily, seasonal) represent another type of tariff, which is determined based upon **short-run marginal costs**. These tariffs strive to match the costs of serving customer loads at specific increments of time. Such costs can vary significantly over the specified time. By an appropriate reflection of the discrete costs in a time-of-use tariff, the consumer receives the appropriate pricing signal for its consumption decisions during the specific time period. This may, for example have an impact on the customer's decision to consume during the peak time period, when the tariff is most expensive, and thus may change the consumer's pattern of consumption.

The main problem associated with this sort of tariff is the difficulty in forecasting changes in demand. That is why this tariff form may not accurately reflect the real costs incurred by the water systems. Additionally, these tariffs are not stable over time.

3. Prices based upon **long-run marginal costs** better reflect the costs for construction and commissioning of new service delivery capacity.

**Box 2. Setting water fees in two Hungarian water companies**  
**Szentes-water Kft.**

In this company the following considerations are taken into account during the specification of water and sewerage fees:

- production cost of water/costs of sewerage and wastewater treatment (electricity, wages, etc.)
- amortization
- other expenses -- emergency fund (for the management of sudden crises with great expenses)
- expected water sales
- minimum profit

In theory, two ways of fee setting are possible: one is based on the expenses, the other concentrates on the sales prices. This system is the combination of the two. In addition to this, in the past five years, the level of fee increase was maximized to 12-16 percent per year.

In the service area of this company household and industrial/institutional tariffs are separate, as are water and sewerage charges.

As can be seen, amortization incomes are not spent on the expansion and development of the public utility assets.

**VCSM Rt.**

The VCSM concession company charges a uniform rate for water supply and sewerage services in all the 12 municipalities supplied by the company, although production costs are different. It does not make any distinction between industrial/institutional and household consumers, believing that all consumers should pay for the actual costs.

The price is fixed according to a general formula including:

- material and energy costs (multiplied by the producer price index); these make up app.

33% of costs

- wages (multiplied by average wage index), app. 45% of costs
- amortization (multiplied by amortization index)
- other costs, concession fee (multiplied by other costs index)
- water and sewerage sales (multiplied by volume change index)
- minimum amount of profit

In some countries, the subsidies provided by the Government to both service providers and some customer classes have a significant influence on prices. Therefore, in most countries the ratemaking process must also acknowledge social aspects (demographics, household income and so on) as well as the economic priorities of the State.

The strong tradition of social tariffs for households, and its expression through increasing-block structures, is stressed for example in Spain, Italy and Greece. A few examples of social tariffs are also now being reported in Hungary. In England, the company leading the way in the switch to domestic metering has introduced new tariff structures aimed at meeting "affordability criteria" (more details on this are provided in the "Low income consumers" chapter). More traditional methods of dealing with "economic hardship" (e.g. discounts on charges for certain groups) exist in US and Australia.

The shift toward increased use of volumetric pricing can be interpreted as a shift toward a more equitable allocation of costs because it better reflects actual consumption by individual users. Similarly, the shift toward extended use of increasing-block pricing within the variable component can be inter-



puted as an effort to place more of the burden on the highest-income users (i.e. to increase the "progressivity" of the pricing system). Both of these shifts can be seen as moves in the direction of a more "social" pricing.

## 4. ELEMENTS OF A TARIFF STRUCTURE

A tariff is the system of procedures and elements that determines a customer's total water bill (any part of that bill can be called a charge, measured in money/time units or money units alone, and any unit price can be called a rate, usually measured in money/volume units). Most tariffs are a combination of some or all of the following elements:

- *connection charge* is a "one-off" and (normally) "up-front" charge for connecting a customer to the public water supply and/or sewage systems. Most countries distinguish between connection charges (non-recurring) and fixed charges (recurring). The economic efficiency criterion suggests that this charge should not be used to recover general system developments costs. To the extent that the latter are affected in the long run by the scale of average or peak demands on the system, they are best recovered through a volumetric rate. Although it may be attractive for cash-strapped public (or profit-seeking private) utilities to secure capital contributions through connection charges, the result would likely be the under-pricing of the final service. In the long run, as domestic water use increasingly takes on (at least in part) the characteristics of a luxury service (power showers, swimming pools, garden use, etc.) under-pricing of the service will provide environmentally damaging and economically misleading signals to consumers.

- A *fixed charge* (sometimes known as a standing charge or flat fee) is normally either equalized for each customer (e.g. within a given customer class or at a particular geographic location), or linked to some other customer characteristic (e.g. size of supply pipe or meter flow capacity, property value, number of water-using appliances, lot size, etc.). In a metered environment this charge should not recover more than "ongoing" customer costs not directly linked to the volumes of water used (i.e. those associated with a customer continuing to have access to the system, such as a meter maintenance and reading, billing and collection costs.)

If a metering (measuring) system is in place, the following elements also be involved:

- A *volumetric rate*, which when multiplied by the volume(s) of water consumed in a charging period gives rise to the volumetric charge for that period. Economic efficiency and environmental criteria both suggest that this element should ideally recover all costs that vary with the average or peak demands made on the system (in both the short- and the long-run). There are several potentially complex issues here, having to do with the "fair" recovery of peak-related costs, but however these issues are resolved, the preference should be to seek recovery of variable costs through volumetric charges, rather than fixed ones. On the other hand, there are two possible reasons for recovering these costs through fixed charges. One is to reduce financial risks for the utility that might ensue from its exposure to the volatility of volumetric charges). The other arises if the costs of sophisticated meter technology and /or more frequent meter reading (necessary for the recording peak demands) are perceived to be higher than the efficiency gains that derive from their use. In such cases, it may be appropriate to look for proxies for the contribution a user should make to peak costs; one such proxy may be the maximum flow of the consumer's supply pipe per unit period of time. The fixed charge could thus be geared to the

potential peak demand that a consumer may make on the system. However, under such circumstances, the fixed charge provides no incentive to reduce peak demands.

- A *block charge*, defined by lower and (except for the highest block) upper volumes of consumption per charging level. Different volumetric rates are frequently attached to different blocks. If rates rise or fall consistently as more water is consumed, the schedules are referred to as increasing- or decreasing-block tariffs, respectively.

- A *minimum charge*, usually imposed to protect the utility's finances, which specifies that a certain minimum volume of the service will be paid for in each period whether or not that amount has, in fact, been consumed.

These are the key elements that constitute a "tariff". Before moving on to consider the current tariff structures of some countries in the region, however, it is useful to review the main tariff criteria (and, sometimes implicitly, the tariff structure elements) that appear to have the strongest influence on the determination of tariff structures.

## 5. TYPES OF TARIFFS

Household water and energy demands are not spread evenly over time. Like agricultural users, households tend to demand more water in hot and dry conditions. Other, non-climatic, factors and habits also drive peaks over shorter periods: within the day and, to a limited degree, within the week. Engineers, economists, and environmentalists all have reason to be interested in such temporal variations, since large costs will be faced by water utilities if supply systems are to be constructed, maintained, and operated at a scale that can satisfy whatever peak flows may ultimately be demanded. In practice, it has been found that tariff policies may have the most to offer in the temporal dimension in time-of-day and seasonal pricing. Other peak demands – for example, peak-day and peak-week – tend to be best handled within general volumetric charging or seasonal tariffs, rather than being granted their own extension of temporal tariffication.

### ***Box 3. Major problems of District Heating in Moldova***

The reform of the public service sector faces a series of critical issues, which are interconnected. The Moldavian case is not exceptional and represents a process of deterioration, decreasing efficiency and increasing arrears. These are some of its features:

A high percentage of equipment depreciation and heat energy losses.

Low level of network load due to a drastic (more than 3 times) decrease in the volumes of heat energy consumption.

A tariff that is high in comparison to incomes among the population.

Low percentage of payment by consumers for heat received.

Huge debts to suppliers of heat energy, fuel, and electricity.

The lack of real decentralisation, in which companies and local government should have expenditure autonomy to find the best economic solution, is one important factor in this process. Any rational economic solution is in most of the cases in conflict with the political interests of those in the public sector, because of the hardships involved (unemployment, sanctions against defaulters and so on)

The following types of water tariffs are commonly maintained in the most developed countries:

- time-of-day tariffs;
- seasonal tariffs;
- tariffs differentiated by customer classes (industrial, agriculture, residential, etc.);
- tariffs based upon various social considerations.

However, the main types of tariff systems used by most other countries in the world/in Eastern Europe continue to include the following.

**1. One-part tariff system** – this system is used primarily for residential and sometimes for industrial customer classes. It means a fixed uniform rate for consumption of one cubic meter of water. In this case, beside the existing capacity, the planned dimension of the sale and its production cost will determine the unit cost. This is the most simple tariff system.

The disadvantage of this is that if the actual consumption essentially differs from that planned, then it will not offer safety for the supplier, and the consumers will not be interested in the rational use of capacities. Regulation based upon one-part tariff systems does not give adequate flexibility to the energy companies to impact on (and optimize) customers' consumption patterns. In most cases the use of these simple tariff forms results from insufficient customer metering capabilities.

**2. Two-part tariff system** – this system is often applied both to residential and industrial customers. One component of this tariff structure is independent of the consumption, but the other component of the tariff, the water charge is designed to cover the cost of energy consumed. This tariff system is based on the principle that a considerable portion of the costs of services is determined by the fixed costs. The variable costs will be realized in the consumption tariff.

Many countries throughout the world maintain the two-part tariff structure. The two-part tariff is very efficient. It can encourage economic dispatch as well as improve the optimization of consumption patterns.

**3. Block tariff system** – in this tariff system, the consumer, depending on actual consumption, has to pay different prices between some quantitative limits. The tariff between these limits might be progressive or regressive.

**4. Tariff system depending on external factors** – in this system the consumer has to pay for the use of services depending on certain external factors, standards. This tariff system can be applied in cases in which there is no possibility for metering consumption or where billing on the basis of standards is more economical than the installation of meters. The advantage of this tariff scale is that it assures the simplest billing.

## 6. THE INVESTMENT COMPONENT

Experts from many countries note the importance of properly reflecting the investment component in the tariffs. The investments imply the acquisition of fixed assets, intangible assets, corporate rights and securities in exchange for cash or property rights, as well as the return on such investments. The investor can recover his capital costs through:

- depreciation;
- return;
- "tax for development" (Romania).

The investment project has to be agreed upon with the local council. Before the negotiation process, the profitability of the investment project should be estimated.

During the privatisation process in Ukraine, the participants were required to submit their proposals for the technical rehabilitation and modernization of the acquired assets and the implementation of modern technologies. The section called "Development program of the energy company" is prepared by the bidder for five years and is evaluated by the Tender Committee.

This program includes the list of measures to ensure efficient operation and systematic development of the enterprise and justification of the necessary amounts and timing of investments.

The "Financial proposal" section (which is evaluated by the Tender Committee at the second stage) includes a detailed breakdown of investments, which are defined in the "Development program" section, specifically:

- of investments;
- financing sources for investments;
- method of investments;
- conditions of raising capital;
- sources to repay the borrowed capital.

The profitability of the investment project is characterized by a number of indicators that reflect a balance of the benefits and costs of the project (return on investment, payback period, other indicators of financial attractiveness of the project, impact of the project on the environment and so on). A number of ratios can be calculated to evaluate the project, for instance benefit-to-cost ratio (i.e. a ratio of discounted benefits to discounted costs), a profitability index (i.e. ratio of profit from project implementation to investments).

There are numerous methods of project assessment and the choice of the appropriate method should be made by the authority that makes the decision on project implementation.

The sources of capital investments include: internally generated cash (self-financing), borrowed capital and shareholder capital.

Shareholder capital is the capital that the company can raise by selling shares on the primary or secondary stock markets. Internally generated cash flow consists of depreciation and retained earnings. Borrowed capital represents loans that can be obtained by the company at a certain interest rate.

The current structure of tariffs for wheeling and supply services by local distribution networks allows for capital to be raised by both self-financing or by capital borrowing. The internal financial resources of the company are generated from cash inflows of depreciation and a portion of net income. However, the cash inflow from depreciation is used for rehabilitation of the existing fixed assets.

The shareholders receive the return on their investments from dividend payments, which are financed through a profit component of the tariff.

## 7. PRICE ADJUSTMENT FORMULAS

### 7.1. Types of formulas

Price setting is necessary whenever a service has to be contracted out for a substantial number of years and/or there is a monopoly supplier who cannot be replaced. The institution of price regulations in modern economies has been accompanied by continual debate over what formulas or standards should be used. Setting prices for public services has never been a simple task, with no single answer as to what may be the best approach. In Great Britain and the U.S. there have been constant revisions of price setting formulas and practices.

Price setting formulas may be roughly divided into two categories: a) rate of return and b) price index. Rate of return standards provide that prices shall cover actual operating expenses plus a specified rate of return on capital investment. Price index formulas range from simple formulas that use only one price index in order to adjust prices to complex formulas, which use a weighted price index reflecting the types of expenses incurred by the regulated service.

**Table 1. Hypothetical Weighted Index**

(a) Factor	(b) Index	(c) Pct. Increase over prior yr.	(d) Weight	(e) Adjustment (c*d)
Wages	National Wage Index	12%	.55	6.60%
Fuels	Fuel Price Index	18%	.12	2.16%
Materials		10%	.10	1.00%
Vehicles Accessories & Parts		20%	.23	4.60%
Total Adjustment				14.36%

Source: K.K.Baar (1998)

The cities contacted in this study used both rate of return and overall price index formulas for adjusting prices. Weighted price indexes were used in only a few instances. Eger uses a weighted index for adjusting water prices.<sup>2</sup>

<sup>1</sup>This section is based on K.K.Baar (1998)

<sup>2</sup>The weights in its formula are as follows: materials - 12%, wages - 44%, amortization - 11%, other costs - 17%, energy - 16%.

## ***7.2. Comment on rate of return standards***

The strength of rate of return regulation is that it rewards increased investment and provides security for the investor. The criticism of the approach is that it provides no incentive for efficiency and encourages over-capitalization.

As a practical matter, it is difficult to administer periodic reviews of cost increases in order to determine if they are reasonable. Determinations have to be made about whether particular expenditures are reasonable, when in reality there are constant tradeoffs (or a lack thereof) between quality and price. It is necessary to determine what types of expenses can be expensed in one year and what types should be amortized and if so over what time period.

Use of standards from other codes, such as a tax code, for determining how expenses should be treated may or may not be appropriate. Fair return calculations may become political, with a commission selecting the desired result and then working backwards to justify that result. In the U.S. rate decisions may be appealed to the courts. However, judicial decisions provide little guidance in the form of specific principles that can guide future commission decisions.

## ***7.3. Comment on the use of price indexing***

Indexes offer certainty, which protects the investor and "protects" the public agency from having to make repeated unpopular price adjustments. On the other hand, the index that is selected may or may not be an indicator of what price adjustments are reasonable. The overall price index may not reflect cost increases for a particular type of public service, which has a far different basket of expenses than the basket of expenses of a typical household used to construct the price index. Yet in light of the complexities and shortcomings of rate of return formulas, price indexes may be most appropriate. On the other hand, use of the overall Consumer Price Index may lead to excessive increases, especially if real wages are decreasing. Therefore, the weighted index approach may be the most appropriate.

## ***7.4. Annual price adjustments based on an index with periodic adjustments of the base price***

In Great Britain, a combination of rate of return analysis and price indexing is used to determine water prices. The initial price is set based on a cost review. Then annual adjustments are based on the overall price index. However, the annual adjustment formula includes an adjustment so that the annual price adjustment is a specified percentage below the full percentage increase in the index. (The adjustment = RPI (Retail Price Index) - X). The "X" factor is based on the theory that the water companies should become more efficient over time. Periodic reviews are then conducted in order to readjust the base price. The first review was conducted after ten years. However, now the water regulatory authority is planning on reviews every five years. While this approach may work well in Great Britain, investors may feel that operating under this type of price control is far more risky in a nation that has a short tradition of private ownership and the application of price regulations to private firms.

## 8. IMPACT OF LOSSES ON TARIFF DETERMINATION:

Usually, in the process of tariff calculation, losses are taken into account. At the outset of a modernization and rehabilitation program, most DH systems in CEE/FSU are characterized by water and energy losses that are high as compared to those in the systems in Western European cities. The inefficiencies are found in the secondary rather than in the primary distribution system. The reasons for this are diverse. Heat losses depend on the water flow, on the temperatures of the hot water, ambient temperature, surface area of the pipes, length of the pipes, and the physical properties of the material used.

The high level of water losses in most of the DH systems indicates the poor condition of the networks, which are prone to corrosion.

## 9. BILLING AND COLLECTING CHARGES<sup>3</sup>

Service charges are collected in one of two ways: at the point of sale (such as a rental charge for the use of recreation equipment) or on a periodic basis for the service used (such as a monthly statement for the quantity of water consumed). While the first approach eliminates the problem of delinquency, it is usually more costly to administer relative to the amount of revenue collected. Periodic billing of users yields the largest portion of revenue from service charges. However, managing accounts receivable creates many of the same problems a private firm encounters when it extends short-term credit to consumers. One of the advantages of a billing system is that the cost of administering each account declines as the number of accounts increases. Local governments typically economize even further by piggybacking several utility and related service charges onto one billing system. For example, the charges for water, sewer, solid waste (refuse) collection, and electric power may be listed on one statement.

Local governments should achieve at least 95 percent collection rate on current accounts. That is, no more than 5 percent of the current charges for billed services should be delinquent. Achieving this collection rate depends on local economic conditions, including the unemployment level, and on the aggressiveness of the collection effort.

Improving the collection of current charges must begin with the design of the statement, which should communicate clearly to customers the amount owed, the basis for determining that amount (quantity used and rates), and the payment due date. If a discount is offered for early payment, this should also be indicated on the statement. However, evidence suggests that discounts do not significantly improve collection rates and that their costs do not justify their benefits to local governments.

One of the greatest challenges confronting those responsible for managing accounts receivable is keeping mailing addresses current. At a minimum, local government should request notification of change of address from the postal service.

<sup>3</sup>This section is based on R.L.Bland (1989)

*Some governments have found that contracting out collection of utility charges is more cost effective than performing the task internally. This will more likely be true where the local government provides only one utility service and has few opportunities to piggyback a number of charges onto one statement.*

Strategies for improving current collections may involve:

- designing the utility statements to catch the attention of users and clearly communicate the amount and the date payment is due;
- keeping account records current, especially mailing addresses;
- building goodwill with utility users by offering more convenient collection points and office hours;
- adopting penalties and interest charges that make delinquency unrewarding;
- considering the cost effectiveness of contracting out collection of current and delinquent accounts.

***Strategies for improving collection of delinquent accounts:***

- establishing a legal basis and procedure for collecting delinquent accounts;
- increasing the intensity of each step in the process of collecting delinquent accounts;
- using discretionary powers such as setoff provisions in contracts, liens on the property of delinquent customer;
- considering contracting out the collection of delinquent accounts to a law firm specializing in that service.

The companies may bill the consumption at stated intervals (monthly, every second month, twice a year, once a year and so on). The following payment methods are available:

- direct payment to the fee collector;
- payment directly to the companies by check ;
- payment by transfer.

In the countries examined, in **Romania** and **Lithuania** consumers pay directly to the companies that provide the public services. In **Kazakhstan** the collection of payments is carried out by the rel-



evant structures provided for in the organizational structure of utilities enterprises. Other systems of collection of payments also existed earlier, but the current system has proved to be the most efficient. In Budapest, there is a company responsible for the collection of the public utility services' charges (including water, sewage, rubbish, gas and district heating, but not including electricity). In Hungary as a whole the consumers pay directly to the local supplier.

## 10. SUMMARY OF KEY POINTS

In many countries in the region there is still a need for a number of reforms in relation to charging. The main actions required are the following:

- The restructuring of tariffs in line with the principles of "consumption-based" (i.e. volumetric) pricing – fixed/variable two-part tariffs based on metered consumption.
- Pricing based on full-cost recovery (see Annex 1).
- The reduction or elimination of subsidies deemed "inconsistent with efficient and effective service".
- Making all remaining subsidies and cross- subsidies more transparent.
- Adequate depreciation charges

As soon as customers have the ability to influence their consumption levels, the consumption of the services will become increasingly dependent on price, family income, prices of alternative systems, quality of service and so on.

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## 12. APPENDIX 1 COST AND REVENUE CLASSIFICATION FOR FULL COST RECOVERY MEASUREMENT

The term full cost recovery implies the recovery through water charges of all economic and environmental costs associated with the provision of the output under consideration. The following table offers one classification of these costs, together with the various charges, taxes and levies that would normally appear separately on a household water bill.

**Table 2**

Costs/Revenues	Public Water Supply	Wastewater
Costs:		
1.Direct Economic Cost	Operating Expenditures (Opex) Capital Expenditures (Capex)	Opex Capex
2.Related Environmental Costs	Abstraction Licence Fees(administration) Abstraction ChargesScarcity Costs/Rents Additional Abstractions Costs: Damages	Pollution Licence Fees(administration)Pollution ChargesAdditional Pollution Damage(losses to producers or consumers)
Revenues:		
1.Charges/Tariffs		
2.Specific Taxes	On water use	On wastewater
3.General Taxes (VAT, etc.)	On water	On wastewater

## 13. APPENDIX 2 TARIFF-SETTING SYSTEMS IN THE DH SECTOR

The role of the municipality as owner of the district heating company is often influenced by political considerations, particularly in tariff policy. Heating enterprises can be and have, to some extent, been used as a tool for supporting the most vulnerable part of population. In principle this is understandable because heating is one of the basic needs of population and, on the other hand, it is the role of the public sector to secure the minimum conditions for all the population. In practice this tends to lead to distortions and inefficiency such as high subsidies from the city budget that are not necessarily well targeted and efficiently used.

If heating pricing is not properly based on actual costs, several negative impacts will emerge. From an overall energy economy point of view, artificially low heat prices do not give strong enough incentives for energy efficiency investments and for efficient utilization of heat by the consumers. From the corporate finance point of view, heat pricing that does not cover all the cost components in a realistic manner does not provide for proper maintaining and development of the DH company and thus leads to inefficient and unreliable heat supply in the medium and long run.

The role of the municipality in tariff setting varies depending on the country. In Poland the tariff setting procedure mainly takes place between each DH enterprise and the Energy Regulator Authority (ERA). The regulator's role is very strong: the increase in price has to be reasonable and well justified. It is difficult to get approval for components for loan repayment and capital costs. The tariff approval procedure can take several months.

The Polish tariff setting system is very complicated and aims to follow the cost structure in detail. The price setting formulas are complicated and lead to complicated tariff systems; basically every boiler and distribution area even within the same city can have different tariffs. The main problem in Poland is that the rules on investment cost depreciation do not correspond properly with the loan servicing costs needed for investments. This tends to lead DH enterprises into financial problems hampering further energy efficiency and renovation investments.

For comparison, **in Finland**, and in most other Western countries, the DH companies have a strong and relatively independent role in tariff setting. The tariffs are calculated by the company and approved by the Company Board. Adjustments are implemented automatically if the cost parameters (indexes) are changed. The Office for Free Competition and the Consumer Protection Office may intervene only on request, e.g. on a complaint by a consumer. Political pressures and local elections have very little if any impact on heat pricing.

Moving from the square meter-based tariff to the consumption-based two-part tariff created transition problems in some Polish cities. In Warsaw, for instance, metering based billing resulted in rapid decrease of revenue of about 20-30%. Political reasons depressed the level of the new tariff system and the correlation between the old and new tariff system was not correct.

**In Russia** heat tariffs are approved by local authorities whereas electricity and gas pricing is the responsibility of the Government/regulatory agency. The consumers' interests are carefully considered; however, the administrations also carry out extensive discussions with the heating companies about the cost basis.

**In Ukraine** the tariffs for central heating are established by the local authorities. The tariffs for households and budget organizations are lower than the tariffs for other groups of consumers.

**In the Czech Republic** there is a price regulation resulting from Act 526 (Ministry of Finance – Price Act). Household prices are regulated by the ERO (Energy Regulatory Office), which sets possible maximum annual growth. For commercial entities market prices are charged.

**In Lithuania** the prices of heat and hot water are set by the utilities and approved by the National Control Commission for Prices and Energy (with some exceptions for large consumers in some big cities) are the same for all consumer groups.

**In Romania** DH tariffs are established locally, correlated with the cost of heat generation, with the type of installation and fuel. The tariffs for the district heating activity are set based on ANRE (National Electricity and Heat Regulatory Authority) methodologies, for every supply zone (every centralized district heating system). Commercial entities and budgetary institutions pay the price set and approved by ANRE. Householders pay the PNR (national reference price), approved by the Government. Today PNR is 575000 lei, equivalent 18.13 US\$). The amount of money representing the difference between the price approved by ANRE and the PNR comes from subsidies from the state budget (55% from the local budget and the 45% from the governmental budget). The Energy Law (Emergency Ordinance no 63/1998) includes provisions in order to oblige cogeneration power plants to split the costs between the two forms of energy (electricity and heat), according to rules approved by ANRE. Cross subsidy between the two forms of energy is forbidden. Practically, the level of cross-subsidies is reduced.

**In Slovakia** thermal sources with a combined heat and power production using steam or hot water networks were built in the past in conjunction with massive flat construction in towns. These systems are still operated. A lot of them are technically obsolete. Some parts of these systems have been reconstructed and coal boilers gasified. Because of the high prices of the district heat in several towns many consumers started to disconnect themselves from the district heat delivery and build small local thermal sources. The district heat price is high because of the cross-subsidies, prices for big natural gas consumers (e.g. enterprises that operate district heating systems) being higher than prices for individual household consumers. Prices for residents supplied by centralized system are lower than the prices of the heat supplied from individual gas boilers in family houses.

Prices in district heat delivery are regulated by the Price Act, number 18/1996 §11- decision-making concerning regulated prices, by the decrees and detailed regulations of the Ministry of Finance of the Slovak Republic. Every modification of regulated prices has to be discussed and ratified in the Slovak government. The price of heat depends on the type of the heating source, type of fuel and economy of operation.

**In Kazakhstan** the tariffs for central heating are approved by the Regulation Authority. They are established on the basis of the costs necessary for the extension of such services and the profit rate calculated for the regulated assets base in accordance with the existing methodology by the "post stamp" method.

**In Estonia**, EMI (Energy Market Inspectorate) regulates the establishment of heating price for the energy traders dominating the market. Pricing is meant to ensure: covering production expenses and return on investments, compliance with environmental protection conditions, compliance with quality and safety requirements, and reasonable profitability. No cross-subsidies are allowed.

**In Latvia** when local governments approve the methodology of tariff calculation they can accept one of the methodologies of tariff calculation approved by the Energy Supply Regulation Council. These are the methodologies of unified and divided tariff calculation. The main difference between these methodologies is that when calculating the thermal energy tariff according to the unified tariff, vari-

able and constant heat production expenses are not separated. Inhabitants pay for thermal energy received only during the heating season. (See Table 3)

**Table 3. Heating Tariffs In Latvia**

	Unit of Measurement	Heating without Meters		
		Average	Minimal	Maximal
<b>Budget Institutions</b>				
Divided tariff				
Winter	Ls/m <sup>2</sup>	0.29	0.15	0.43
Summer	Ls/m <sup>2</sup>	0.19	0.10	0.35
Unified tariff	Ls/m <sup>2</sup>	0.42	0.10	0.65
<b>Enterprises</b>				
Divided tariff				
Winter	Ls/m <sup>2</sup>	0.30	0.15	0.43
Summer	Ls/m <sup>2</sup>	0.19	0.06	0.35
Unified tariff	Ls/m <sup>2</sup>	0.47	0.20	0.48
<b>Inhabitants</b>				
Divided tariff				
Winter	Ls/m <sup>2</sup>	0.30	0.15	0.46
Summer	Ls/m <sup>2</sup>	0.19	0.02	0.35
Unified tariff	Ls/m <sup>2</sup>	0.47	0.10	0.54

## NOTES

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