

Tariff reform in the municipal water supply
First expert workshop

**TARIFF RULES: COST IDENTIFICATION, COST ALLOCATION
AND RATE STRUCTURING**

- POSSIBILITIES FOR UKRAINE -

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1. INTRODUCTION

In Ukraine, emerging trends and issues surrounding the tariff setting process are leading utilities to evaluate whether the current tariff structure is responsive to current needs of utilities. Being a logical last step in tariff setting process, tariff structure design only recently began to get more interest of utilities economists and regulators who traditionally pay more attention to the issues of revenue requirements identification and allocation of revenue requirements to various cost components and classes of customers.

This paper will review pricing practices in Ukraine for centralized water supply and wastewater services and provide a set of recommendations that can be considered for implementation in Ukraine and possibly in other NIS. The observations presented in the reports are an output of a project funded by United States Agency for International Development (USAID). The review is based on the data provided by Khmelnytskyi and Lutsk water supply and wastewater utilities, which are participating in the USAID Tariff Reform and Communal Services Enterprises Restructuring Program (further Program) as pilot utilities since July, 2001. We will also summarize the information, which was obtained from local experts at the course of training sessions conducted by the specialists of the Program at request of local administrations and program counterparts at the national level. The program is one of its kind in Ukraine because throughout the Program USAID coordinates its efforts with the Government of Ukraine (GOU) at the national and local levels. With the support of the reforms at the national level, the tariff setting experience of the pilot cities will be tested for applicability and potential replicability in other regions of Ukraine. USAID may choose to examine the proposed options in other cities, which could be selected during the roll-out program.

At the national level the activities are coordinated with the Ministry of Economy (MOE), the Ministry of Finance, the State Committee for Construction, Architecture and Housing Policy (SCACHP), the Ministry of Labor and Social Policy (MLSP), the State Anti-Monopoly Committee and the Association of Ukrainian Cities (AUC). The activities in the tariff reform and communal services sector are also coordinated with non-USAID-funded international donors that are currently conducting related activities at the national and local level in several cities throughout Ukraine, including OECD, the World Bank, the European Bank for Reconstruction and Development (EBRD), TACIS, DEPA.

2. BACKGROUND

In 2000, the Ukrainian Government initiated new reform efforts in municipal sector of economy, which set off rapid changes in system of price-setting for centralized water supply and wastewater services. These reforms in the first place were aimed at adoption of a rational and economic system of tariff setting that could ensure cost recovery in the sector, prevent municipal economy from collapse and would allow improvements in the level and quality of services provided to the customers.

The State Committee for Construction, Architecture and Housing Policy of Ukraine (SCACHP) in coordination with the Ministry of Economy, Ministry of Finance and the State Anti Monopoly Committee has developed a set of regulatory documents, which introduced the principles of economic efficiency and equity into the tariff setting system. Among those documents were “Rules for Calculating Two-part Tariffs for Heat and Hot Water” (approved in 2000) and “Procedure for Pricing Centralized Water and Wastewater Services” (further – Procedure) (approved in August 2001).

3. INSTITUTIONAL CONTEXT OF WATER SUPPLY AND WASTEWATER SERVICES PRICING

In Ukraine, the national government adopts general requirements related to identification of costs that can be recovered through water and wastewater tariffs. These requirements are spelled out in the procedures and instructions of the central executive bodies and passed to the local level to enforce. National government takes control of the situation if there is no enforcement at the local level only in the issues related to quality, safety, labor, taxes, allocation and use of budget funding provided to the utilities and anti-monopoly legislation.

Since 1995, in Ukraine there is a national program of targeted assistance to low-income families. Targeted subsidies for housing and communal services are an attempt by the government to subsidize the

poorer members of the population. The subsidies are paid to water enterprises through subventions from the state budget. According to the data of the State Committee of Statistics, by the end of 2001 up to 15% of households were enrolled into the program and received subsidies for communal services¹. There also exists a system of privileges for payment of housing and communal services that are set for individual categories of citizens. The right for obtaining privileges is defined in about 40 legal and regulatory documents and based on different characteristics including professional status. The system is also financed through subventions from the state budget. Different estimates indicated that about 25% of Ukrainians were using privileges for payment of housing and communal services in 2000. Their billings were decreased by 20, 30, 50, 75 or 100%.

Most water and wastewater utilities in Ukraine are either state owned or transferred by state to local governments and called “communal” (public) enterprises. All water and wastewater enterprises are operated as economically independent entities. Tariff setting is regulated by the executive body of the local self-government and by an oblast state administration if the entity is state owned. Though the system of price regulation of state owned utilities requires improvement. Several water and wastewater enterprises serve more than one municipality in a particular oblast. It is not clear if regulatory authority is assigned to the oblast where the facilities are located or to each city administration where service is provided. Under current legislation, private enterprises are apparently not subject to any price regulation. However, because there few registered privately owned water and wastewater utilities in Ukraine, this issue is not being discussed broadly yet.

In Ukraine, publicly owned utilities are viewed as businesses, which are subject to income taxes and other charges and business taxes on money they make above their costs. In the private sector such revenues would be called profits. The fact that Ukrainian utilities are considered businesses, which are subject to all national and local taxes, creates conceptual conflict between the system of enterprise ownership and the system of price setting and regulation. When the company is publicly owned the shareholders are the taxpayers who do not receive benefits in the form of dividends. Local government is responsible for provision of services and at the same time it exercises control over the utility and serves as tariff regulator. For these reasons it is hard to find the logic in making public water companies that do not elect to sell services in the new competitive market place a subject of severe regulating disciplines than exist for companies operating in truly competitive markets. In Ukraine, current tax legislation makes the system of pricing and price regulation for public utilities overly and unjustifiably complicated. Such system also means that communities do not gain much benefit from maintaining utilities in public ownership. This is because they do not gain benefits nor in the form of lower tariffs for communal services, nor in the form of improved efficiency, which is better achieved through engagement of private owners or operators.

Operated as commercial entities, utilities have traditionally been allowed to recover returns through tariffs. Originally, all water and wastewater utilities were state-owned, and their estimated returns were calculated as percent of operating costs. The profits of the utilities were used as the source of financing capital investments and vast number of expenses, which in international accounting practice would be considered operating and maintenance expenses. This system proved to be overly cumbersome, non transparent and difficult to understand by customers. Transition to market oriented economy revealed inherent problems of such system. Since 1991 there have been extensive expert discussions regarding inefficiencies in the price setting practices of municipally owned and state-owned utilities.

As an attempt to solve problems in the system of price-setting there was developed the new price setting methodology which had to address the following issues: full costs recovery, profit planning, capital costs planning, optimization of taxation, promotion of efficiency through price cap regulation, improvement of tariff equity among customers, introduction of alternative tariff structure designs. The next sections of the report will discuss in greater detail some of these issues.

¹ State Statistics, form №1-subsidies (HCS) “Report on the status of providing housing subsidies to the citizens to recover costs of housing and communal services and costs of purchasing liquid gas and solid fuel”, the number does not reflect per cent of households receiving subsidies for solid fuel.

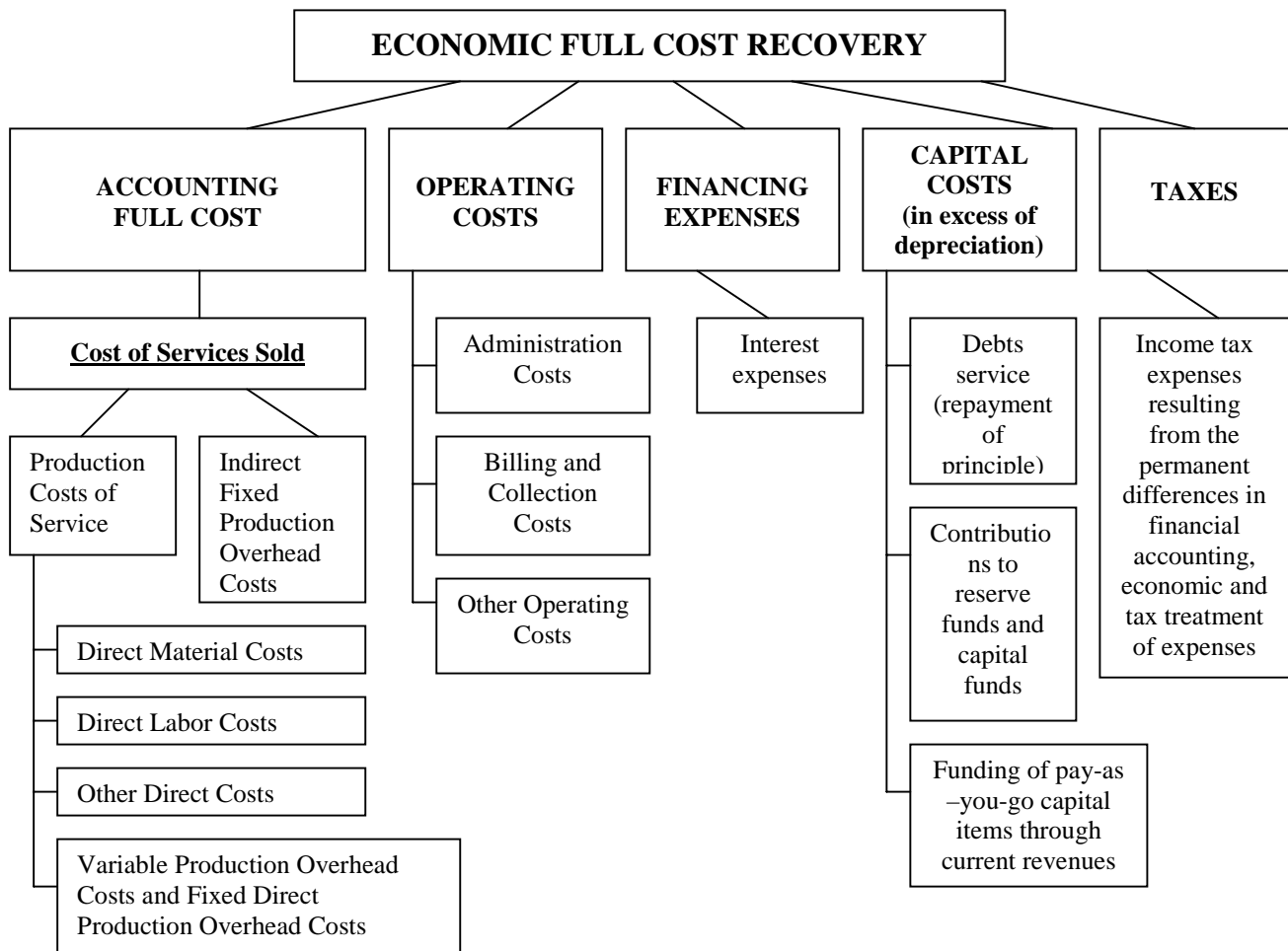
4. WATER SUPPLY AND WASTEWATER PRICING RULES

4.1. Identification of Costs

Prior to the introduction of the Procedure, municipally owned and state-owned utilities have been establishing their revenue requirements on a utility (allowable return) approach basis. The costs, which could be recovered through water and wastewater tariffs, consisted of predefined costs of operating activities, depreciation and interest expenses. In addition to costs, water and wastewater utilities were allowed to recover profits. Operating expenses were used as the basis for determination of rate of return.

After implementation of the Procedure the major changes have occurred in the way utilities determine revenue requirements and identify costs to be recovered through tariffs. The Procedure tried to achieve the objective of full cost recovery. In the Ukrainian context the meaning of full cost recovery in the first place is the recovery of all economic costs incurred in the recovery period. They include expenditures of utility's operating activities; interest expenses, resulting from enterprise's financing activities; and costs associated with utility's investing activities (in the amount of capital funding required through annual revenues in excess of depreciation). Full economic costs are identified in Figure 1.

Figure 1. Economic full cost recovery.



a) Expenditures of operating activities

The new Procedure allows utilities to recover expenditures of operating activities without restrictions that are defined in tax legislation, which classifies some reasonable expenses as payments to be made from profits and consequently not tax-deductible.

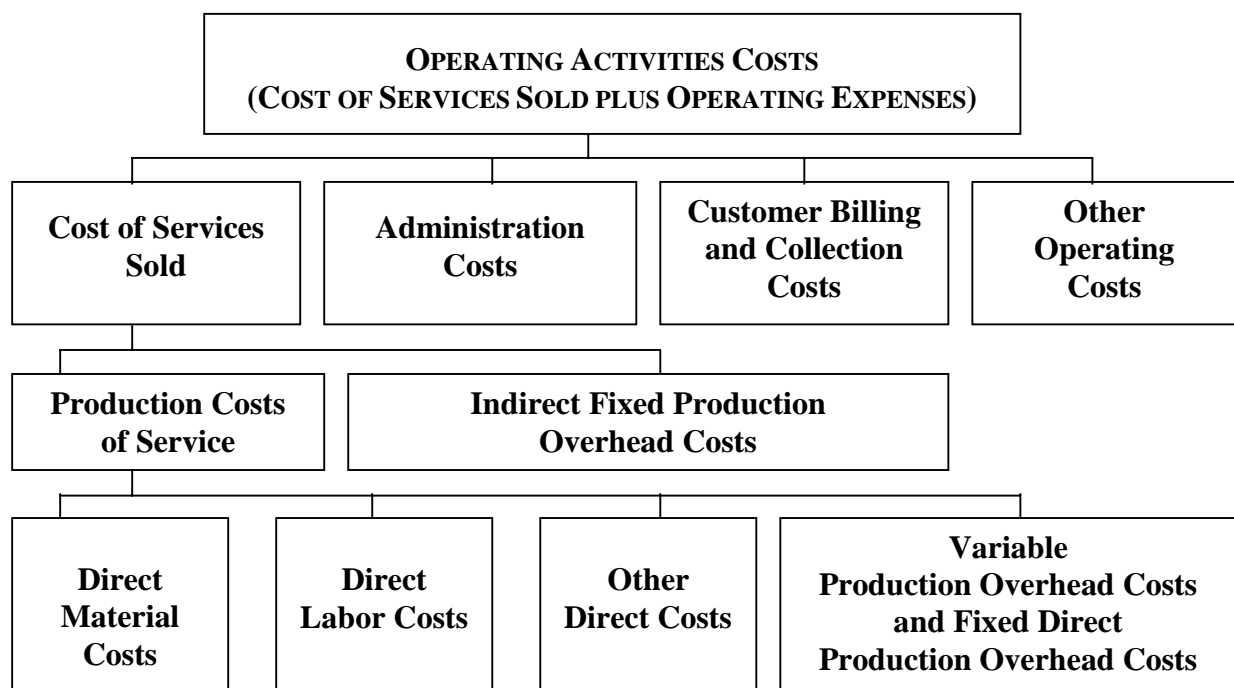
i Costs classification

For price-setting purposes expenditures incurred by the utility during its operating activities are classified in accordance with the new national Ukrainian Accounting Standards (UAS) that are closer to International Accounting Standards (IAS). Before 1999, Ukrainian enterprises followed accounting

practices established by the Soviet Union. Under legislation that took effect since January 1, 2000, the Government of Ukraine requires all enterprises to follow UAS. Expenditures of operating activities include: the costs of services sold and operating expenses. *Cost of services sold* is the value of materials, labor and other resources consumed directly in production of the services sold during a recovery period. *Operating expenses* are the cost of resources that are consumed as part of administrative and selling (collection and billing) activities.

Figure 2 presents the classification of operating activities expenditures in accordance with UAS that is used as the basis for identification of operating and maintenance revenue requirements. The costs are grouped into broad functional categories: production, administration, billing and collection and other. Each functional category is represented by the costs, which are relevant to each category. These costs are classified through detailed chart of accounts. The chart of accounts is approved at each enterprise in accordance with the national guidelines. The national typical chart of accounts also provides the standard codes for each expense account as well as functional category. These codes are used by all the utilities. The choice of sub-accounts will vary among utilities.

Figure 2. Operating Activities Costs.



The Ukrainian Government considered using UAS classification and grouping of cost items of operating activities as the most appropriate classification system because it supports consistency in costs planning, monitoring and data reporting from year to year. It also gives basis for adequate comparisons of the relevant cost items among utilities. In addition, current methodology recommends to group expenditures of operating activities by “economic elements” that include: material costs, labor costs, labor-related taxes, depreciation of fixed assets and other costs. These two classifications are used for different purposes. The first one is used for rate setting and accountability by functional unit and another one for control over total level of material, labor and other costs.

ii *Bad Debt Expense*

The new methodology allowed recovery of bad debts in tariffs because in Ukrainian accounting system bad debt is an expense item. However, the utilities have not gained experience in determining doubtful accounts reserve and actual bad debts write-off because the UAS were introduced at the beginning of 2000 and only recently tariff-setting methodology allowed utilities to recover bad debts in tariffs. This was the first attempt by the Ukrainian Government to make the system of price setting more transparent. Until now the returns estimates in the tariff calculations have not indicated true profitability because there was no allowance made for recovery of bad debts. Without such allowance there have never been true profits gained by the utilities at the year-end. In addition, no source of financing has been created for paying overdue bills to energy suppliers.

On the other hand, it is not totally appropriate to include bad debts into tariff calculations from the social point of view because paying customers will be subsidizing defaulting customers. The problem of late and non-payment is cited by utility managers as the most serious problem. Approximately 60% of receivables are due from residential customers. The average period of accounts receivable outstanding is ranging from 6 to 12 months at the pilot utilities. Currently utilities do not have mechanisms to discontinue services or to impose penalties for late payment, which could help the collection process.

This situation is very common for the whole Ukraine. That is why there have been long debates whether to include bad debts into tariff calculation or not. We believe that after utilities determine their reserves of doubtful accounts and show this numbers to regulators, the next step to improve price-setting system and make it more economically viable could be to enforce collection mechanisms and to return to the system of imposing penalties for late payment.

iii Depreciation

Depreciation is an allowable expense for water and wastewater utilities. Currently funding of capital items is made mostly through depreciation. In accordance with the price setting procedure the utilities can choose among the methods of depreciation. These methods are outlined in the UAS 7 “Fixed Assets”. For tax purposes, current legislation allows to treat as tax-deductible expense only the amounts of depreciation, which are calculated based on the rates specified in the Law of Ukraine “On Enterprise Profit Tax”(639/97 - VR) that are applied to the net book value of assets. Any amounts in excess of the estimated figure are not considered legitimate expenses in tax legislation. Therefore, in making capital investment decisions and planning capital costs recovery in tariffs the utilities managers should not ignore the affect of depreciation on taxes.

If the utility plans to recover in tariffs depreciation that is calculated based on methods and rates that are different from tax ones and in case the amount is higher than the one determined in accordance with the tax legislation, the water utility has to plan income tax expenses for the exceeding amount and include it into tariff calculation. This system of taxation does not motivate utilities to choose other than tax methods of depreciation, which would better meet their requirements and provide sufficient funds to renew or replace the assets. The information in Box 1 illustrates calculation of depreciation at one of the pilot utilities, shows other drawbacks of the existing method and suggests an option for solution of the problem.

Box 1. Water & Wastewater Pricing in Ukraine. Calculation of Depreciation

The Ukrainian utilities estimate depreciation based on the net book value of assets (gross value of asset minus accumulated depreciation).

As of January 1, 2001

Cost/gross book value of fixed assets of the pilot utility, is Hr 113 million

Accumulated depreciation is Hr 80 million

Net book value amounts to Hr 33 million (Hr 113 million – 80).

In accordance with the effective depreciation rates for different groups of assets that are applied to the net book value of assets the depreciation for a year amounts to approximately Hr 2 million. Although the accumulated depreciation is Hr 80 million, the water utility has no cash resources to replace fixed assets.

Under UAS as well as IAS, there are many bases of depreciation of fixed assets. Although net book value basis, is one of the bases of depreciation, it will be more appropriate for fixed assets to be depreciated based on revaluated cost figures instead of the written down value. Depreciation under the cost/revaluation figure basis will result in a depreciation charge much higher and more realistic, from a replacement of assets point of view. For this purpose, the utilities may have to use this method of asset valuation, which is already allowed by UAS, in price setting. It is also important to coordinate any changes in accounting methods of depreciation with the tax legislation so that depreciation expenses in financial accounting match the amounts of tax-deductible expenses.

It is important that cash resources equivalent to the value of depreciation charge be set aside to replace assets. An alternative is to have a developed capital investment plan, and invest cash resources on a regular basis on replacement of fixed assets and infrastructure rehabilitation, to a value equivalent to the depreciation charge.

Source: USAID/PADCO, Inc. “Financial review –F/Y 1999 & 2000, Lutsk Vodokanal”, September 2001

At January 2002 exchange rate 5, 25 UAH are equivalent to 1 USD

iv Direct vs Indirect Costs

For the purpose of price setting, the existing classification of operating and maintenance costs identifies direct and indirect costs. However, the Procedure does not give basis for allocating costs, which can not be directly attributed to water and wastewater revenue requirements. The utilities are allowed to choose the allocation method for each indirect cost by using the most logical basis. Traditional cost drivers that vary in proportion to service production are volume-based (e.g. direct labor hours, direct labor costs, machine hours etc.). Generally, direct labor costs of personnel within water and wastewater production divisions to total direct labor costs are used as percentages for allocation of all indirect costs to water and wastewater revenue requirements. There are some utilities, which do not use any logic for indirect cost allocation and simply divide indirect costs in equal proportions between water and wastewater services. These are utilities with homogeneous customer structure and almost equal level of providing water and wastewater services. However, someone may argue that absence of direct logical relationship between the basis of allocation and functional nature of expense item does not reflect the true costs of service from the customers' point of view. This issue might be researched more so that recommendation on cost allocation can be provided to the cities and territories, which have significant variances in consumption of water and wastewater services by different customer groups (e.g. high percentage of residential customers who leave in individual houses and do not use centralized wastewater services, or industrial customers, which use water from aquifers but dispose wastewater into centralized system).

b) Financing Costs

Under current regulation the utilities can include interest expenses resulting from their financing activities into tariff calculations. The Procedure provided the list of financing activities, which include borrowing through bank loans, issuance of bonds and financial leasing. Based on the terms of agreements between lending and borrowing parties, the amounts of interest can be included in the cost basis for tariff setting.

c) Capital Costs

The Procedure established new provisions for determining capital requirements in tariffs. Capital costs are defined as those associated with funding of capital investment programs, including acquisitions, construction, rehabilitation, modernization and other capital improvements of plant and facilities, and other costs related to acquisitions of non material assets, which are depreciated pursuant to the Law of Ukraine "On Enterprise Profit Tax"(1997).

They are treated as funding that is required for implementation of capital investment programs during the budget year in excess of depreciation. The amount of capital costs in the tariff is determined based on the financing method that was chosen to support capital investment program and the amount of related costs, which have to be recovered in the budget year. Annual capital requirements have to be based on a capital investment program and a long term financial plan. This change enables enterprises to plan capital investment programs. Capital items that are funded through the capital investment program are capitalized for accounting purposes and depreciated over defined period of time.

Capital investment costs can be allocated to customer classes on the basis of benefit or any other basis that would be chosen by the utility and approved by the regulators. Broad definition of capital costs allows flexibility in the choice of specific capital expenditures. However, the provisions of the Procedure leave some ambiguity, which has to be clarified through guidelines. The Procedure does not explicitly list the capital costs, which can be recovered through tariffs in excess of depreciation. For example, current methodology does not specify whether it is possible to make planned contributions to reserve of capital investment funds, which can be established for the purpose of accumulation cash over extended periods for future investment into major facilities. It is assumed that long term financial planning will help utilities to identify future cash flow problems and they will figure out mechanisms for building up necessary reserves or accumulating capital funds. The Procedure could also be more specific on identification of costs associated with repayment of principle on bond issues or commercial loans.

It is not yet clear how the utility economists in projecting capital costs over long periods will consider inflation and discounted time value of money. The Ministry of Economy will have to provide construction price indexes or other appropriate indexes, which can be used by the utilities. Both at the national and local level there should be provided support of the reforms that includes training and publication of manuals on capital planning issues. This will help to overcome existing obstacles that are created by the lack of managerial capacity and capital planning expertise at the utility level.

d) Profit, return on investment, or return on assets

The Procedure eliminated the concept of “profit (or return) planning” in tariff setting. No longer is allowable return estimated as a percent of operating expenses (a practice that should not be encouraged). Allowance for capital costs recovery through user charges substituted allowable return for the utilities of all forms of ownership.

However, the drawback of the current Procedure is that it does not recognize allowable profit or return for not-publicly owned utilities. This should be different than a profit on operating expenses. The regulation should be clear on the mechanism for calculating return for these types of the utilities.

e) Taxes

Currently, in Ukraine water and wastewater utilities have to pay 10 mandatory taxes and fees, which is the highest number of taxes being paid by a communal utility either to the state or local budgets. The taxes and fees include:

General Mandatory Taxes & Fees

- Communal tax (комунальний налог)
- Land tax (плата за землю)
- Payment for use of radio frequency (плата за использование радиочастот)
- Tax from the owners of transportation vehicles (налог с собственников транспортных средств и других самоходных машин)
- Income tax (налог на прибыль)
- VAT (налог на добавленную стоимость)

Specific Water & Wastewater Taxes, Charges and Fees

- Fee for geological works (сбор за геологоразведывательные работы)
- Payment for special use of water resources (плата за специальное водопользование)
- Fee for environmental pollution (сбор за загрязнение окружающей среды)
- Payment to the special fund of the local budget 10% of drinking water costs, which is sold to the customers that does not meet drinking water standards (отчисления в специальный фонд местного бюджета 10% стоимости питьевой воды, которая реализуется через системы централизованного водоснабжения с отклонением от требований стандартов)

VAT is also charged on water and wastewater services at 20 per cent. Recently consumers raise great concern regarding recovery of VAT through user charges for water and wastewater and all other housing and communal services. However, no enough research have been made on the effect of VAT elimination or rate reduction that is charged on the communal services in relation to the expenditures of the state budget on financing of targeted assistance programs to low-income families and privileges to individual groups of customers.

Pursuant to the new Procedure the utilities obtained the right to account in tariffs the differences, which exist in economic, accounting and tax treatment of expenses. Some legitimate operating costs are not treated as tax deductible in tax legislation. Consequently, if there is a difference in treatment of costs in financial accounting and in the tax legislation, the utilities can plan recovery of income tax expense through tariffs. They are estimated at the existing enterprise profits tax rate of 30% per cent. Among others, the differences exists in the treatment of the following costs: depreciation (see paragraph ‘depreciation’ of this report), transportation costs incurred by administrative staff, mandatory payments to the social insurance fund of invalids if the utility does not employ the normative number of invalids, marketing expenses etc. Capital costs are not tax deductible in the period in which they have occurred but they are depreciated over time. No tax incentives exist for investment in capital items.

Ukrainian Government considered essential that economic (including accounting) costs are differentiated from costs that are treated as tax deductible for tax purposes in the new pricing methodology. The existing methodology prior to the adoption of the Procedure simply mandated utilities to pay all the differences existing in financial accounting and in tax legislation from allowed return. Such practice did

not show actual amounts of profits, which remained for financing of capital programs. Most amounts of revenues in excess of expenses in financial accounting were spent on payment of mandatory taxes, and basically misrepresenting the real financial position of the utility. Clear definition of costs and the use in tariff setting classification of costs that is based on the types of economic activity rather than on tax deductible or not tax deductible principle was a great step forward towards full economic cost recovery and self sustainability of the Ukrainian enterprises.

4.2. Allocation of costs to classes of utility customers

In Ukraine, as a rule, there are the following classes of customers:

- Residential (inside city, residing in multi-storied houses, individual buildings, in rural arrears)
- Budgetary organizations – institutions and organizations financed from state or local budgets (schools, hospitals, municipalities, military bases etc.)
- Commercial and industrial customers (usually treated as one class)

Current pricing rules do not specify allocation principles that are based on the cost of providing services to individual customer classes. Theoretically, costs may be based on the following characteristics as: location of customers from the source of water supply (or wastewater treatment), types of networks that serve individual customer classes, customer demand characteristics such as high or low system load in peaking times etc. At the same time, some utilities levy special charges to industrial customers for high wastewater strength.

Utilities allocate costs by dividing all projected costs (overall revenue requirements) by overall projected amounts of water sold or wastewater collected. Volume projection is based on the consumption norms for non-metered customers and average consumption of metered customers. Average cost per m³ is multiplied by projected volumes of services sold to individual customer groups to come up with the required revenue requirements from that class or group of customers. However, if the regulatory body (in most cases municipality) determines that from the political or social point of view an average tariff is too high for residential and budgetary organizations, the utility has to offer another estimate of cost allocation to classes of customers. Usually, the tariff for commercial and industrial customers will be increased and decreased for residential and budgetary customers without economic justification. In total, the utility comes up with the overall revenue requirement amount. In Ukraine there are very few municipalities that allow equal tariffs for all customer groups. Cross subsidization that is not based on economic allocation principle is a more common practice.

a) Improvement of Tariff Equity between Residential and Commercial Accounts

Numerous recommendations, which have been provided by international donor organizations and international financial institutions, were to gradually move towards tariff equity between residential and other accounts. Data analyzed in the reports have indicated that there was a wide disparity between the rates paid by residential customers and commercial/industrial accounts. Table 1 represents selected data provided by SCACHP that shows high level of cross subsidization in some regions of Ukraine such as Crimea and Donetsk oblast.

Table 1. Water Tariffs in Selected Oblasts of Ukraine

#	Oblast	Cities and rayon centers with population of more than 50 thousand people	Tariff for commercial & industrial customers UAH/m ³	Tariff for residential industrial customers UAH/m ³	Increase of tariffs for industrial & commercial over residential (times)
1	Crimea AR	Feodosia	3.53	0.28	12.6
2	Crimea AR	Simpheropol	3.60	0.30	12.0
3	Crimea AR	Yalta	2.10	0.19	11.1
4	Crimea AR	Alushta	3.37	0.32	10.5
5	Crimea AR	Kerch	2.39	0.24	10.0
6	Kyiv	P. Khmelnytsk	4.81	0.50	9.6
7	Crimea AR	Evpatoria	1.50	0.17	8.8

8	Donetsk	Mariupol	2.92	0.40	7.3
9	Donetsk	Makiyivka	2.87	0.40	7.2
10	Donetsk	Donetska	2.70	0.40	6.8
11	Kyiv	Ukrainka	3.55	0.53	6.7
12	Donetsk	Kramatorsk	2.56	0.40	6.4
13	Crimea AR	Jankoi	1.07	0.17	6.3
14	Donetsk	Yasynuvata	2.31	0.40	5.8
15	Donetsk	Gorlivka	2.30	0.40	5.8
16	Donetsk	Khartsyzk	2.30	0.40	5.8
17	Vinnytsya	Murovani-Kyrylivtsi	3.00	0.58	5.2
18	Kyiv	Boryspil	1.71	0.35	4.9
19	Vinnytsa	Vinnytsya	1.14	0.24	4.8
20	Vinnytsya	Gaisyn	1.86	0.42	4.4
21	Donetsk	Zugres	1.58	0.40	4.0
22	Sumy	Romny	1.77	0.47	3.8
23	Vinnytsya	Orativ	2.20	0.60	3.7
24	Vinnytsya	Pishanka	1.80	0.50	3.6
25	Vinnytsya	Tyvriiv	1.32	0.40	3.3

Source: SCACHP Information Center data (specially collected for economic department of SCACHP, in January 2001).

It is obvious that such system is inherently unfair and could promote a lack of investment in commercial enterprises. It can not be economically viable in a long run to continue with this practice. In addition, big commercial and industrial customers will be looking for opportunities of switching to other water utilities that charge lower prices; or to direct extraction from artesian aquifers.

b) Providing Equity to Existing and Future Customers through Improved Allocation of Capital Costs

Price setting procedure suggested that capital costs could be recovered from different customers groups through application of coefficients that represent portion of costs to be recovered by individual customer groups. The coefficients can vary from 0 to 1. The guidelines do not specify the basis for application of the coefficients. It would be useful to prepare a list of available international practices, approaches and methods of assessing capital cost recovery from existing and new customers. This is because existing customers receive different level of benefit from implementation of capital investment programs than the new ones. As an example of the factors that drive differentiation of costs among customer classes could be: construction of major improvement of the facilities that serve individual customer group or class, or decision on how to treat costs incurred for public good, e.g. to maintain fountains or fight fires. Should the latter costs be reimbursed by local administrations through budgetary funding or they should be recovered through tariffs for drinking water. This would give some guidance to the utilities about how to assess effect of a particular method of capital costs recovery on existing and new customers and lead to greater equity in price formation.

4.3. Rate structure design

Emerging trends and issues surrounding the tariff setting process are leading utilities to evaluate whether the current tariff structure is responsive to current needs of utilities and whether it allows charging customers appropriately their fair share of costs. The purpose of an effective rate structure is to maximize the pricing objectives of the utility, which promote basic pricing principles. The following principles identified in OECD report (Household water pricing in OECD countries; 1999) could determine the choice of the relevant tariff structures by the communities: allocation (economic) efficiency, equity, financial requirements, public health, environmental efficiency, consumer acceptability and understanding, administrative costs.

According to OECD definition of tariff structures, Ukrainian enterprises use only one kind of tariffs – uniform tariffs. Its design structure has one element that has to recover both fixed and variable costs. There are no minimum or seasonal rates charged in Ukraine. Uniform tariffs are used both in metered and non-metered systems. Water metering did not become a standard practice in Ukraine, so water utilities

use consumption norms in most cases for billing purposes. Number of registered residents in a premise is used as the basis for billing. In the near future, elimination of the mandatory registration policy (rus. “propiska”) for the population might pose a challenge for utilities: the utilities would need some objective criteria for the customer billing that might require creating and maintenance of new databases. Alternatively, they might continue to use current billing methodology. However, annual registration of households at the place of their actual consumption of services should substitute registration at the place where the person owns property.

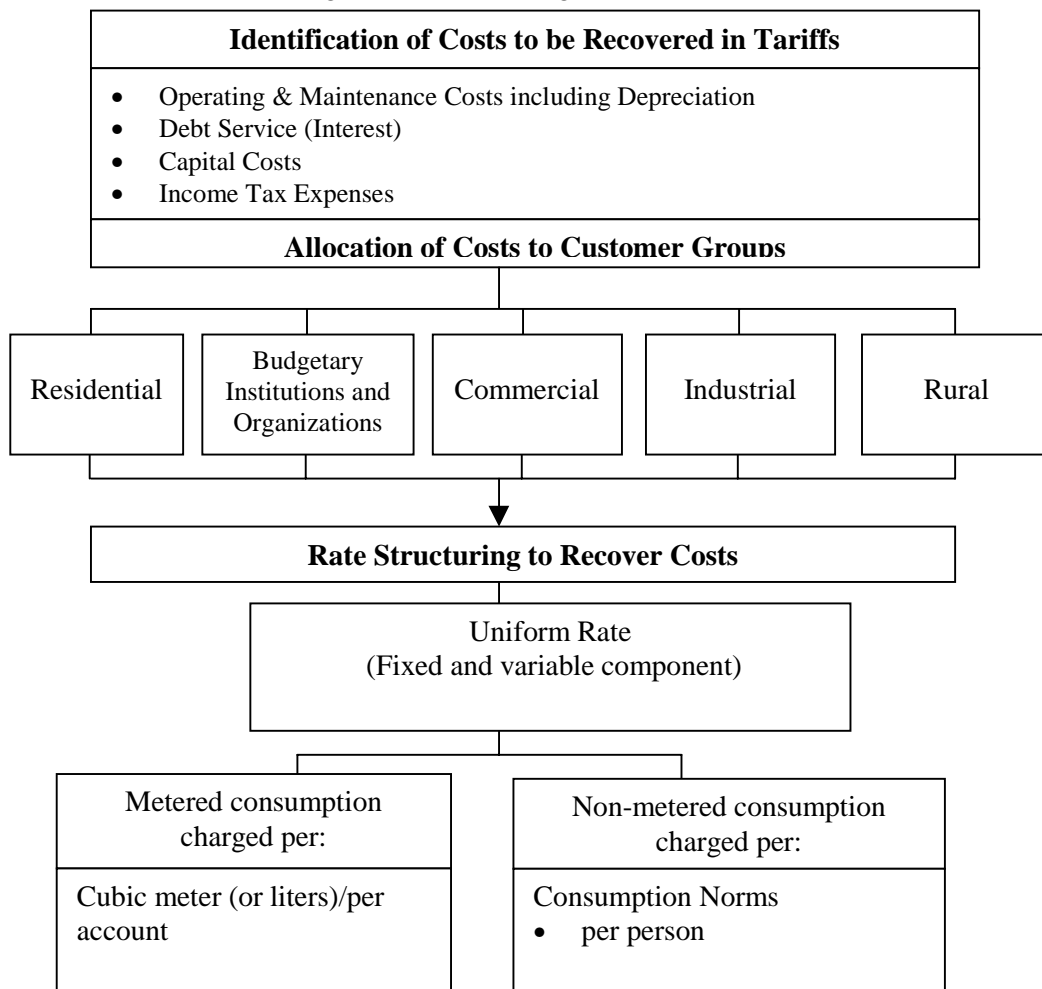
To summarize, recently, among other issues, the following questions have raised concerns of the economists in regard to the rate structure design:

What should be the basis used for billing purposes, other than number of people, in the absence of propiska? What kind of data will the utilities have to maintain if there is no information on the number of people registered?

How fair are the existing consumption norms in relation to all other alternatives? Is it appropriate to continue using them for billing purposes? Are there options available for improving billing equity?

Some may argue that current system of billing based on consumption norms and the absence of differentiation in tariff structures results in unfair recovery of costs by different classes of customers. Until now there has not been conducted enough economic research to prove the reasonableness of such statement. Increase in the costs of providing services, instability of revenue stream resulting from customer delinquency of payment, and irrational water consumption drive the need for more research of tariff structure design options. Alternative tariff structure designs are considered as ways to solve some of the existing problems.

Figure 2. Tariff Setting Process Scheme



The Program consultants attempted to make some analysis of the rate structure issue with the help of the pilot utilities. Existing tariff setting process was reviewed. Figure 2 represents the tariff setting process scheme of Ukrainian utilities. The fairness of the preliminary conclusions was tested at some regional

seminars with other utility economists and regulators. In this report we will share these preliminary thoughts for further discussion of the expert groups. Several traditional rate structures that are widely used across US by government utilities were evaluated for applicability in Ukraine by their economic characteristics and their potential impact on different water and wastewater customers. There were used two basic approaches for defining rate structures: rate structure that establishes recovery of costs through fixed and variable elements (two-part tariffs), and the structure designed to recover a part or all costs of additional system capacity constructed for the use of new customers. For clarification purposes the theoretical explanation of the approaches is provided below.

a) Fixed /Consumption Charges

In designing a rate structure, it is common that water and wastewater utilities establish a combined rate structure consisting of a *fixed* (service) charge and a *volume* (consumption) charge.

Establishing and charging an appropriate fixed service charge

Most OECD countries distinguish between fixed charges that are designed to recover fixed “*recurring*” costs on a regular basis and “*non-recurring*” fixed charges that are charged on a one-time basis and usually called as “connection fees” or “capacity charges”.

Normally, the fixed charge is established to recover some base amount from customer on a regular basis regardless of usage. This amount may include customer service costs of billing and collection, account maintenance, meter maintenance and reading, customer service, etc.; some portion of fixed costs such as debt service; portion of capital costs; fixed costs of operating activity that are not directly related to the volumes of the services sold, including accounting, administration, safety etc.; or combination of costs.

OECD report summarizes the determinants for allocation and charging of fixed costs by water and wastewater utilities in OECD countries. Two major approaches are used for cost allocation. First, by either equally dividing fixed costs by number of accounts (e.g. customers within a class or geographic location). In this case, annual fixed costs are divided by the number of accounts, which determines the service charge per account per year. This method of fixed costs recovery is based on the assumption that it takes approximately the same amount to service each customer, or this amount of costs is incurred by the utility whether or not the services are consumed. The costs should be apportioned equally to all customers regardless of individual customer consumption and be charged on a regular (e.g. monthly) basis. Second, by basing fixed costs allocation on some other characteristics, such as diameter of supply pipe, meter flow capacity or meter-size equivalents, property value, number of fixture units, lot size etc. Combination of various measure units may be used for recovery of different types of costs.

There are fixed rates that some utilities charge for provision of specific services. These rates may be either recovered through tariffs or charged separately for particular services. They might include: charge for opening account, meter testing, notification charge, meter removal charge, fines and penalties to be imposed for unauthorized connections, discharge pollutants in excess of set limits, industrial surcharges to recover additional testing and treatment costs for excessive strength of wastewater from industries etc.

Establishing and charging an appropriate consumption charge

Consumption charge or volumetric rate recovers remaining costs from customers based upon usage. This rate when multiplied by consumption volume should be equal to the revenue requirement for the recovery of all variable costs in that period.

Variable costs are divided by projected consumption volumes, which results in a charge per some volumetric unit, such as gallons, or cubic meters. In most systems water is metered. Data obtained from regular meter reading is used as the measure of water usage. In the systems, where water is not metered, the charge is based on one of the following billing methodologies: equivalent residential unit (EDU), fixture units or number of water using appliances, property value, front footage, lot size etc. Wastewater charges may be calculated based upon actual water consumption, actual measurement by special wastewater flow meters, a percentage of water consumption etc.

In Ukraine, the cost of one cubic meter of consumption by each customer is charged based on metered or normative consumption. Ukrainian consumption norms of cold and hot water for *residential* customers per person per day vary from 95 liters to 300 liters. Climate conditions, system network condition, the levels of losses and availability of basic conveniences or water using appliances such as sink, shower,

bath etc. determine the normative level. Consumption normative for residential households are approved by the regulatory bodies. Consumption rate is charged based on the normative per registered person in each household. If commercial or industrial customers are not metered, than normative consumption levels are determined based on the industrial guidelines (SNIP 2.04.01-85, Internal Water and Wastewater Networks, Water Usage Norms). The guidelines recommend water usage norms per measure units such as one seat (for theatres), one working place (for stores, institutions), one kilogram of linen (for laundries) etc.

More complex volumetric rate systems are possible when utilities need to structure the rates, which reflect cost of service characteristics of different classes of customers. Different rates are identified for different usage blocks – upper and lower - that are developed based on the analysis of consumption usage by each customer class, the frequency of billing within a particular billing interval and percentage of bills that fall within this interval. The *block rate* is charged separately for each usage block. Systems with multi block rate structure have different unit charges for each block that generally reflect the cost of providing service to a particular class of customer. The utility determines a dominant customer class that consumes most in a usage block and links the rate in this block to the cost of service provided to this customer class.

In some instances, a *minimum charge*, can be 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

b) Capacity/System Development Charges

Capacity charges relate to the cost of new construction, major rehabilitation, repair or extension of the facilities for supply, treatment, and transmission. These charges are typically allocated to each customer based on meter size, or in the absence of meter, equivalent dwelling units, number of fixtures, or the front-footage of the premise. They are either charged on a one-time basis at the time service is initially provided or over a longer period. Capacity charges are billed on a fixed/variable basis as described above.

When utility chooses an estimated load (based on meter size etc.) of a connected unit as the basis for allocation of some fixed *capital costs*, a high consumer will be paying a higher portion of these costs. It is believed that the network, development of which constitutes significant part of the capital costs, is build to accommodate a certain system capacity. A high usage consumer occupies a relatively large share of this limited capacity, and should, therefore, pay a larger share of the fixed costs than a small consumer.

Yet, there is another view on the issue of sharing maintenance and capital costs by high-usage customers vs small -volume ones. It can be argued that high volume customers should only pay for the operating costs and portion of capital costs of large transmission mains, while low-usage customers should pay for the smaller distribution networks. The latter costs may be significantly higher than the costs of large transmission lines.

5. TWO-PART TARIFF STRUCTURE - IMPACT ON CUSTOMERS AND UTILITY FINANCES

In this section we will discuss in greater detail a two-part tariff structure, which can be currently used as a billing methodology in Ukraine. Some pros and cons of other tariffs and rate structures are presented in Annex 1 of this report. In order to assess the need for changing uniform rate structure in Ukraine to more complex tariff structures it is necessary to analyze the economic basis, which would determine the appropriateness of the change.

In the current water sector legislation it is optional for the water and wastewater utilities to implement alternative to the uniform rate tariff structure. A “two-part” (or two elements) tariffs can be established. Procedure defines:

- the *fixed charge* as an annual cost of maintenance of a capacity unit that is connected to the water or wastewater system
- and the *consumption charge* – as the cost of a cubic meter of services consumed.

This definition does not specify what should be treated as maintenance cost and what should be the basis for estimating capacity - whether potential demand of a supply pipe of particular size, or meter flow

capacity, or any other determinate. It is also not clear whether special methodologies can be established to allow recovery of system development costs, costs of peak demand facilities, or whether fixed element can include other than capacity maintenance costs.

There is no practice in Ukraine of establishing two-part tariffs in water and wastewater industry. However, in the heating sector (heat supply and heating of water) there are utilities, which establish two-part tariffs for heating services and charge them in heating and non-heating seasons. Experience of heating utilities may be analyzed and tested for appropriateness of application in water sector.

Two-part billing methodology has received favorable acceptance in many international tariff reform projects. The basic concept of a two-tier rate structure is that there are certain costs that are fixed and certain that vary with the amount of consumption. The essence of this proposed change is that it is a fairer method of charging customers than under current billing methodology that is used in Ukraine. Current billing policies and procedures result in billing inequities that impact cash flow and payment for services. A two-part system of tariffs can be viewed as a potential solution for the utilities, which would like to reflect in tariffs efficiencies of serving large customers, encourage conservation or recover costs of holding unused capacity available for peak demand time.

Special rate structure needs to be established only when there is economic basis for special rate structure for each customer class. The key is to recognize that the rate-setting structure addresses the pricing philosophies of the utility and the community. The following factors impact the choice of the particular kind of tariff, which has a two-part structure:

- Level of metering (total, partial or no metering);
- Extent of cross subsidization between customer groups (e.g. high, low);
- Number of customers and disproportionate customer structures (e.g. numerous high volume users, numerous small volume users);
- Significance of fluctuations in demand patterns during different times of the year (e.g. increase of demand in summer/winter seasons);
- Age of the system, which determines the level of operating and capital cost requirements;
- Requirements for conservation of water resources;
- Existing rules on types of costs that can and can not be recovered through fixed and variable charges if the combined tariff structure is desired (e.g. limited definition or broad);

Two-part structures make most sense in the metered systems. In Ukraine, metering is not a common practice. Non-proportional metering of households, existence of apartment block meters together with individual meters, that are used by the utilities for billing purposes, results in the complexity of billing and unfair allocation of costs among customers who have meters and who do not have meters. Many city administrations have developed policies to lower price per cubic meter for the households, who install meters. However, the experience have proved some economic inefficiencies inherent in this policy: in some cities the level of individual apartment metering by residential customers reached up to 40%, but delinquency in payment and delays in informing utilities about actual consumption volumes adversely impacts the revenue stream of the enterprises. In some cities up to 30% of households receive housing subsidies. As a rule, these households can not pay for the installation of meters and, consequently, subsidizing those, who have installed meters. Among other questions, which have to be answered before the utility decides to choose a particular tariff or tariff structure are the following: Will there be special fees or charges, e.g. meter reading and testing, developed for the customers who have meters or the costs will be recovered through drinking water tariffs? Is this approach fair for the customers who do not have meters?

High level of cross subsidization between accounts can limit the flexibility of the utility in the choice a particular tariff structure. It is not yet clear what impact two-part tariffs might have on the residential and industrial customers where currently the level of cross subsidization reaches 12 times. From the macroeconomic point of view, any change of tariff structure in the regions with the high level of cross subsidization should be assessed together with the costs of the housing subsidies program. Should the cost for residential customers go up, the higher financial burden might be placed on the national budget.

The age of water and wastewater systems in many cases is exceeding depreciation period. Due to inefficiencies, old systems have higher proportion of operating and maintenance costs than capital costs in the overall revenue requirements structure. The share of operating and maintenance costs currently

reaches 95% of overall costs. It is necessary to anticipate the effect of higher capital spending (including debt service) on customer classes and allocate these costs equitably through tariffs. If fixed costs are relatively high compared to the variable costs due to large system improvement capital costs and, therefore, the fixed part of the tariff is relatively large compared to the variable part, the incentives to efficiently use water are minor. If these costs have to be equally proportionate to all customers and regularly charged, there is little economic justification for establishing a two-part structure. At the same time, from the cash flow point of view high fixed costs provide more predictable cash flows and help to maintain revenue stability.

Significant variations in demand patterns throughout a year may justify the use of two-part seasonal tariffs. This might be appropriate for the communities with high proportion of households residing in individual housing who might be using more water in summer; communities, which have winter/summer tourist attractions. In Ukraine, water and wastewater utilities experience temporary fluctuation of cold water demand due to operating problems of heat supplying utilities that warm up cold water. Customers' delinquency in payment for hot water increases debts of these utilities to the gas supplying companies. In their turn, heating companies limit supply of hot water in summer season. Water sales of water utilities drop during this period.

Following the discussion of a two-tier tariff, the Program consultants discussed the advantages of a seasonal rate structure/peak use tariff methodology. A seasonal rate could be instituted along with a two-tier tariff methodology so that enterprises, which have variances of demand during the year (e.g. Crimea), could continue to bill for its fixed costs during all seasons and bill for its cost of production during the seasons it is providing the service. No economic gain or loss is envisaged by changing to these methodologies.

A peak use rate for Vodokanals (e.g. in Crimea) along with the two-tier rate methodology would provide some benefits to both the customer and the utility. Customers are now unhappy when they have to pay a bill in the winter when they are not peaking the facilities. Not charging customers the "fixed" costs of production in the winter would be good public relations. For the Vodokanal, getting their money from customers when the service is being provided to meet higher demand makes sense from a cash flow perspective since that is when the Vodokanal is being asked to pay most of its bills.

Generally oversized Ukrainian water and wastewater utilities, which have no conservation concerns, have little economic basis from the revenue stability point of view for establishing two-part or multi block rates. This is because there are large fixed costs and low marginal costs that are decreasing until the existing system capacity potential is exceeded. However, there are regions in Ukraine, where conservation is a concern (e.g. Donetsk oblast, Crimea, city of Lviv, etc.) and new tariffs and tariff structures might be considered.

Existing definition regarding types of costs that may be recovered through fixed and variable component are not clear for the economists. In order to avoid uncertainty, more detailed guidance should be provided on the definition of different tariffs and tariff structures. Otherwise, current provision of the Procedure will not be enacted. At the same time, in the international practice, there is no consistency as to the split of some maintenance and capital costs between fixed and variable elements and their allocation to particular customer class. The rational decisions will be based on the objectives and goals of the utility and community, reflecting promotion of particular philosophies regarding impact on customers, equity and fairness, promotion of conservation, the ability of the rate structure to provide revenue stability etc.

Two-tier methodology could be designed to be revenue "neutral" in that it should neither increase nor decrease the current revenues of the utility. However, the choice of the rate-setting approach has a significant impact on the distribution of costs among the levels of consumption and classes of customers. The switch to the two-tier methodology will be fairer to high consumption users who pay today a disproportionately higher share of the fixed costs. For smaller customers this methodology will have an opposite impact – they will recover higher portion of overall fixed costs when compared to the average cost methodology. Two-part tariff methodology could help to eliminate equity problems of charging uniform rates in the systems with metered and non-metered consumption (see Table 2).

Table 2. Two-Part Rate Equity

	Total Cost		Customer A	Customer B
	Fixed	Variable	2 m ³	3 m ³
<i>Uniform Rate System</i>				
Metered	--	5	2	3
Non Metered	--	5	2.5	2.5
<i>Two Part System</i>				
Metered	1	4	2.1	2.9
Non Metered	1	4	2.5	2.5

Source: USAID/PADCO Seminar on Economic Issues in Financial Planning and Tariff Development at Communal Service Enterprises (Vincent Byrne)

In the absence of propiska the utilities may choose to use for billing purposes the information about value of property, number and size of meters, water supply pipe size, number of fixture units in the premises etc. However, this change might become very difficult to administer. Creation of a new database system will require a new, sophisticated data processing and computer communication system, additions to staff, etc., which will be translated into high costs both for the utilities and customers. In addition, unique nature of the specified data could only satisfy the needs of water and wastewater enterprises, which will not be a good strategy for the whole communal services sector. There is some organizational infrastructure available already for maintaining unified registration databases. Despite the major organizational problems to overcome in the development of a new registration system, including development of the whole legal framework in the short-run and development of the automated databases in the long run, the unified registration system could better serve the needs of municipal utilities. It could be a cheaper option for the whole community than development and maintenance of utility specific databases. Municipal utilities will have to obtain access to these databases. As the users of such information, they might have to pay annual fees for the data collection and reporting service.

Not only a change in registration policies tends to drive the need for changing billing methodologies. Growing customer sophistication on fairness of consumption norms pushes utilities to research other billing options. The most equitable billing system is obviously a fully metered one. That is why the issue of metering has attracted so much attention. However, due to the lack of financial resources, meter installation has not become a broad practice yet. Given today's reality, the utilities might seek for available options for achieving greater billing equity through new tariff structures.

Based on the analysis of the options for the tariff structures charged in metered and non-metered systems, it has been concluded that there are some potential benefits to customers from two-part tariff structure. Large service users will benefit from two-part tariff charges. This structure could improve equity among metered and non-metered customers who currently pay uniform volumetric rates by making metered customers pay their fair share of fixed costs. No difference it is expected to make for non-metered customers. Fair allocation and recovery of capacity/system development charges among customer classes will improve billing equity. The allocation of capital costs based on the assessment of the load of a connected capacity (e.g. measured by the meter size) can be used as an option. In this case, one may expect increase of charges for large users who place greater capacity load on the system. Utilities, which experience high fluctuations in demand and have to maintain unused capacities during low-demand periods, might consider introduction of peak use rates. This will shift the burden from the customers who do not peak the system. Preliminary, a little justification was identified for introduction of two-part rates in the systems that have low level of metering or the level of cross subsidization is high due to political decisions. Perfect equity is not possible in the non-metered systems because the economic benefit achieved through diversity of rate structures will be much lower than administrative costs associated with design of such rates.

6. OTHER ISSUES RELATED TO PRICING OF WATER AND WASTEWATER SERVICES

6.1. Metering

Discussion of metering is one of the most controversial issues in implementation of tariff reform and reform of the water and wastewater sector as a whole. Thought it might seem evident that the installation

of meters is a good practice leading to elimination of excess consumption, providing incentives to reduction of customer losses, resulting in lower operating costs, improving measurement of production and distribution losses, and promoting greater customer billing equity, it is not clear yet whether installation of meters in Ukraine in individual apartments is cost justified.

During the meetings with the Chief Economists of the pilot utilities, the PADCO team identified some problems related to metering that are difficult to solve and that create a lot of billing and procedural problems. Most of the problems are related to the metering of individual apartments in the multi-apartment buildings. They include the following ones:

- Poor quality of meters
- Installation and maintenance by customers
- Many meters required – sometimes four or more
- Metering causes customer inequities
- Customers read their own meter and pay for the services
- Meters result in higher costs related to customer service (including installation of additional telephone lines), control and inspection of installation

These problems translate into higher costs, billing inequities and other issues that raise the cost of doing business. The essential question is whether there is economic benefit in continuing to promote policies that encourage customers to install meters in their households. The existence of an apartment meter and inside meters used by some apartment units creates billing problems when trying to reconcile and pay for the entire consumption of the building.

In addition, some inequities are inherent in the current billing methodology between customers with meters and those without. These inequities occur because the norms are much higher than the actual readings would indicate since losses are part of the norms. This means that those customers that cannot afford to install meters are subsidizing customers that can afford to install meters. Inequity even increases when municipalities decrease tariffs to customers who install meters.

A preliminary conclusion regarding metering is to encourage individual metering; however, create legal and regularity mechanisms to allow using apartment block meters for charging purposes and delegating responsibility to organizations that maintain buildings (Condominiums, Associations of Owners, Cooperatives, ZHEKS etc.) to split the bill among individual accounts.

6.2. Introduction of Tariff Adjustment Techniques and Indexing

There is an ongoing debate at the national level regarding introduction of tariff adjustment techniques and indexing of individual cost items. The subject of the debate is whether to allow planned indexing of costs at the stage of tariff calculation and approval or contingency indexing if individual expense item have lead to the increase of overall costs by more than 10 per cent. Economists favor planned indexing because it allows planning for inflation and avoids unnecessary price increases during recovery period. However, the system of index development and availability of indexes for application at the local level can not be called viable at this moment of time. We believe that this issue will find its solution in the nearest future. The initiative in this matter will be most likely be made by the Ministry of Economy.

Automatic indexing of cost items does not seem to be a viable alternative for application in Ukraine if the tariffs are regulated as fixed charges. If individual municipalities introduce price cap regulation method, than it might be reasonable to introduce automatic indexing of tariffs.

7. CONCLUSIONS

This report has identified a range of topics that may need to be considered by the tariff policy makers. Some of these topics may need to be adequately addressed in legislation, regulations, and others may be left to individual enterprise judgment. This report provided some pros and cons of those things that might be addressed in the regulation or guidelines in order to be sure that each potential topic is clearly stated.

Tariff systems are needed to balance the contradiction between popular short-term objectives of low tariffs and enterprise long-term goals of service improvement, environmental efficiency, and sustainability. Ukrainian tariff system inherits features of regulatory and political tariff systems. Cost-

based regulatory approach is used for regulation of water and wastewater tariffs. The utility is required to demonstrate and justify both its costs and its cost allocation methodology. In addition to allowable costs, the enterprises have been allowed to recover a return on operating expenses. Tariff setting in Ukraine also has elements of political regulation, when political perspectives of the elected body are brought on the table, for good or for bad, in order to be accounted in tariff setting.

The new Procedure tried to take into account the unique nature of communal enterprises that operate as private business but are currently publicly owned. The reform in tariff setting eliminated profit or returns planning. Instead, the Ukrainian Government broadened the classification of costs allowable for recovery in tariffs by introducing economic classification of costs. Capital costs in excess of depreciation became a part of the tariff despite the fact that in accounting these expenditures are not recognized as expenses during fiscal period in which they are incurred.

Planning of capital costs that exceed depreciation is now determined by utilities mostly following *cash-needs* approach, while *utility* approach will continue to be used in identifying costs of operating activities (which include depreciation) and interest expense. This combination of approaches in revenue requirements establishment shows the attempts of the Ukrainian Government to fix current inefficiencies of the pricing system. Given the fact that Ukrainian public utilities are paying all business taxes, this hybrid approach sounds more reasonable than previously used one. However, one may argue whether this change in planning is relevant for shareholder owned utilities or the ones, which attract private sector participation, because investor-owned companies operate with the incentive to earn a reasonable profit.

Recent transformation in pricing rules is indicative of conceptual problems, which determine the process of price setting and regulation practices at communal enterprises. Legal and institutional weaknesses in Ukraine are standing in the way of converting water utilities into commercially run entities and make unclear responsibilities for price setting, regulation, investing and maintaining of water and wastewater infrastructure. These problems can not be solved by pure changes in price setting rules. A major challenge confronting communal services industry is to define a legal and tax status of a communal enterprise and to accept existence of other possible ownership forms of enterprises, which can provide communal services. Some experts believe that solution of this conceptual issue will be essential for the success of the reform in municipal services economy in Ukraine.

The immediate effect of new provisions of the Procedure on the price-setting practice in Ukraine should not be overestimated. The lack of sufficient comparative data on price levels, tariff structures or level of metering does not allow making sound conclusions and recommendation regarding the choice of tariff structure options throughout Ukraine with respect to the economic and environmental differences of the regions and sizes of utilities. Such situation also stimulates political speculations regarding inefficiencies of tariff setting and unreasonably high tariff levels. The regulatory bodies at the local level have limited opportunities to learn about innovative practices initiated by different municipalities. Implementation of the new provisions will be gradual. Comprehensive training program would be necessary to support this effort.

8. RECOMMENDATIONS

As the next step in the implementation of tariff reform in Ukraine, the Ukrainian Government might set rules, which reflect differences in decision process and decision-makers status for public and private enterprises, where there is no political check on rates by an elected local self-government body. At a minimum, it could be recommended to create or identify the entity or entities that will determine prices, lay out any local options, and outline the process for price setting.

With regard to pricing decisions, a one possible regulatory regime for Ukraine may be suggested:

- Where the utility is owned by a single municipality, tariff approval would continue to be done by the city administration;
- Where the enterprise is non-public, the city administration would have tariff approval authority if the utility provides services to the community at its respective territory.
- Either independent board that substitutes regulation of oblast administrations or oblast administration should represent interests of several municipalities and regulate prices of communal enterprises that provide services to several communities, or the enterprises, which are not publicly owned and provide services to more than one municipality.

Pricing rules should be based on the type of utility's ownership and have to reflect differences relevant to publicly and privately owned businesses. Such approach could be the first step to recognize basic institutional differences existing between such utilities and allow implementation of the proposed economically and socially viable pricing system in Ukraine through further improvement of pricing rules² regarding:

- Identification of allowable costs
- Cost allocation
- Profit, return on investment, return on assets
- Authorization for specific tariffs, tariff structures and fees
- Tariff-setting procedures

a) Identification of allowable costs

Some issues are relatively clear in regulation, e.g. operating activities costs, and financing costs. More problematic issues deserve special attention, including bad debt, various benefits and perquisites, depreciation, capital costs, taxes. In order to avoid inefficiencies in pricing, depreciation and capital reserves have to be addressed separately – treatment of these costs in water and wastewater pricing should be similar to overall market practices, which would provide economic motivation for investment and renewal of assets.

b) Costs allocation

To improve equity and fairness in pricing, regulations could set principles and limits about how enterprises should allocate allowable costs to various customer classes, and among specific fees and charges. For example, there may be provided recommendations that give guidance to what extent can and should capital expansion costs be allocated to existing customers, and to what extent should they be recovered from new customers. This could allow to recognize the differences in costs and benefits of system development to individual customer. Such specifications are likely to affect enterprises' investment decision making, which is highly determined by the level of risk associated with the given investment. The greater the risk of not recovering a given capital cost, the less likely the enterprise will be willing to incur such a cost. Recent trends to privatization of water and wastewater utilities will be requiring regulatory guidance on these issues. Specifically, by allowing enterprises the choice of their own mechanisms for cost allocation in tariffs for individual customer groups that would help them to ensure return of the investments.

c) Profit, return on investment, or return on assets

Pricing rules should be clear about how to plan allowable return for municipally owned, state owned and privately owned utilities. With utilities that are not privately owned it would be reasonable to continue current practice of not allowing any mark-up or return over economic costs, because profit or return acts like a tax, it raises the cost of service, and in essence the local self-government body is taxing itself.

With private enterprises, the rules need to specify the base, or possible bases, on which profit or return will be calculated. To the extent that regulations allow profit on operating expenses, operations will tend to be more expensive, as rational operators seek to maximize profit. To the extent that rules allow a return on capital investment, investment will be encouraged.

d) Authorization for specific tariffs, tariff structures and fees

To avoid uncertainty, and to allow flexibility, it may be appropriate to include in a regulation a list of the kinds of tariffs and charges that may be used by enterprises in designing their tariff structures. Examples include:

- uniform rate, currently used in Ukraine

² Regulatory guidelines on pricing rules that are suggested for discussion in this report are based on the experience of two projects - USAID/RTI project in Poland and USAID/PADCO, Inc. project in Ukraine.

- uniform rate with fixed component to acknowledge the equity in fixed costs recovery by large and small users as well as metered and non-metered customers
- base rates for service availability
- volumetric charges based on usage
- block and bulk rates to reflect efficiencies in serving larger customers
- inverse block charges to encourage conservation
- capital charges to shift some of the burden of new facilities from existing customers to new customers who benefit from growth/capital improvement
- peak use rates to be a methodology assisting the water and wastewater utilities having cash flow problems due to demand fluctuations to recover the cost of holding unused capacity available
- Special fees and charges: fire charges to recover the cost associated with maintaining capacity and pressure beyond that needed for potable water; industrial surcharges, to recover added testing and treatment costs from industries whose effluent has contaminants or characteristics that make it harder to treat than ordinary household waste; fines and penalties to be imposed e.g. when customers make unauthorized connections, discharge pollutants in excess of authorized limits, or otherwise violate rules

It is understood that water and wastewater service pricing must vary with local conditions and needs, consequently, the list would not be a mandatory one. It would include possibilities that are open for economists with the guidance about how particular kinds of tariffs and charges may be used. This will provide alternative solutions for various ways to recover a particular cost, but not to recover it more than once.

e) Tariff setting procedures

Regulations should address the process for deciding on tariffs, which might have the following steps: enterprise applies to the regulatory body with a proposed estimate of tariff levels and supporting cost data; businesses and citizens review data during a stated period; citizens and businesses file written comments and evidence on the proposed tariffs up to the specified date; the regulatory body reaches decision based on the documented information. Special rate structure implementation would require the guidelines regarding type of data that must be collected to support rate modifications, procedure on how to determine rate updates and how to explain the rate to the customers.

Special attention should be given to the service issues that are closely related to the issues of pricing, including metering, building of technical capacity and affordability.

f) Metering

To answer the questions of a likely economic benefit to the enterprise and customers to install meters, feasibility to achieve goals of cost reduction and lowering of system losses by installing technical and commercial meters, and making a policy decision whether building or individual meters should be used by the utilities for billing purposes, it may be appropriate to prepare economic cost justification related to metering by individual households. More analytical work on the installation of meters as a benefit to the metered, non-metered customer and/or enterprise should be devoted, perhaps on a national level. The results of the analysis would have impact on the choice of the tariff kinds, tariff structures and special fees.

g) Building of additional technical capacity

To enforce implementation of tariff reform, it is necessary to build appropriate technical capacity in the sector both at the regulatory and enterprise level, including legal, economic and accounting skills. In Box 3 there is described a strategic approach suggested for implementation of Polish tariff reform.

Box 3. Strategies on building technical capacity: Polish approach

Another approach to balancing the information advantage that enterprises might otherwise have would be to provide technical expertise (accountants, economists, lawyers and engineers) on a "circuit rider" basis to municipalities dealing with a tariff case or the evaluation of competitive privatization proposals. Somewhat like the central regulatory institution, this advisory institution could attract a critical mass of regulatory experts and apply that talent seriatim to cases around the nation, in those cases where the city retains regulatory authority over its local water and wastewater enterprise.

Whether providing such technical capacity requires a new, or separate institution is not clear. For instance, it may be that if the central regulatory institution creates this cadre of experts for those cases where the municipalities do not regulate, it could share the experts with local administrations that do retain the regulatory function themselves.

Source: Water and wastewater services: regulatory framework decision points. Poland. March, 1999

h) Service affordability

To measure the level of the actual customers' ability to pay higher rates for service and to overcome natural reluctance on the part of the Chief economists to raise rates that inhibits capital planning and spending for much needed capital improvements and focuses the organization on ways to reduce operational costs, methodologies may have to be developed for accessing customers' ability to pay as well as indicators to measure and interpret the data.

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Rate Structure Design Overview

Metered System

- Uniform Rate with one-time Capacity Charges or with Fixed Charges
- Two-part Tariffs
- Descending Block Rates
- Ascending Block Rates
- Seasonal Rates/Peak Use Rates

Non Metered System

- Equivalent Dwelling Units
- Fixture Units
- Front Footage (m)
- Ukrainian Consumption Norms
 - Billed Based on a Number of People

Charges Based on Metered Consumption

- **Uniform Rate/Uniform Rate with Fixed Service Charge/or with Capacity Charge**

Uniform rates are the rates, which are the same for all customers and customer classes at all levels of consumption. The cost of unit of service is calculated by dividing all economic costs of providing a service (including operating, debt service and capital costs) by expected consumption. In most cases, commercial/industrial customers are charged a premium above the residential rate, which is typically not economically justified or substantiated. This type of charge is usually used in conjunction with the fixed/consumption charge concept.

Advantages :

- The most simple billing methodology;
- Understandable and accepted by most customers;
- Easy to implement, administer and update.

Disadvantages:

- May not reflect cost of service and usage characteristics among classes of customers;
- May not differentiate costs of providing services in peak demand periods;
- All customers pay the same system development charges;
- Does not give a base for customer best decision making on efficient use of existing facilities by mixing the costs that relate to existing and new facilities in an average cost per unit.

Rate Structure Design

Uniform Rate (with one-time Capacity Charges or fixed charges)
Fixed and Variable Costs
<u>Charge:</u> per m ³

- **Two-part Tariffs**

Two-part Tariffs	
<p>Fixed Charges - recurring</p> <ul style="list-style-type: none"> • Capital Costs (e.g. debts service) • Portion of Fixed Operating Costs (e.g. administration, billing and collection) • Special Customer service Costs (e. g. meter reading, testing) 	<p>Consumption Charge</p> <ul style="list-style-type: none"> • Variable Operating Costs (e.g. materials, energy) • Portion of Fixed Operating Costs (e.g. production overhead, salaries of production overhead staff)

	<ul style="list-style-type: none"> • Portion of Capital Costs (e.g. salaries of construction workers, building materials)
<u>Charge per:</u> Account Meter size Pipe size Fixture units etc.	<u>Charge per:</u> m3 (non-metered system- EDUs, fixture units, property value, front footage, lot size, meter size normative consumption/per person) m3 (metered system - actual usage)

• **Descending (Inverted Block) Rate Structure**

The rate, which decreases when consumption decreases. This methodology includes a high base or *minimum consumption charge* and entitles customers to a certain usage (variable depending on usage characteristics of the jurisdiction). After the customer exceeds the base usage, the rate per unit of consumption decreases. A typical rate structure of this kind usually includes three – five blocks. The theory behind this structure is that large users would not pay more than their fair share of the fixed costs and in some cases this structure is used to attract large water users. It is not unusual in many communities to negotiate favorable rates with large industrial users to attract these companies to locate their operation within the jurisdiction.

If a combined rate structure has been chosen, the following design issues should be answered: how many usage blocks should there be, will it be a multi block or one consumption block system, what should be a cut-off point for each block.

Advantages :

- Economically beneficial to large users;
- Good vehicle for local governments for attracting large industrial water users to operate in the community.

Disadvantages:

- Does not promote conservation and may not be advised for communities that have scarce water resources;
- Does not provide incentives for metering that can accrue financial advantages due to reduction of leakage at customer level;
- More difficult to implement and administer than uniform rate;
- May pose difficulties in developing appropriate usage block boundaries.

Rate Structure Design

Volumetric Block Rates (with One –time Capacity Charge)	
Consumption Charges	
Recover both Fixed and Variable Costs	
Usage Block 1 Consumption from 0- 30 m3	Usage Block 2 Consumption >31 m3
<u>Charge per:</u> m3	<u>Charge per:</u> m3

• **Ascending Block (Increasing Block) Rates**

This type of structure is similar in concept to the Descending Block methodology except that the rate in each block increases as consumption increases. This type of rate structure is developed to encourage conservation of water resources. It has been widely used by communities throughout the world. Recently this pricing methodology have been considered as move towards “social” pricing because it places higher economic burden on highest income users of high water use luxury appliances and high volume water users.

Advantages :

- Can be established to reflect marginal cost pricing principles - setting rates equal to the cost of providing the next unit of service;
- Mostly understandable by customers
- Can be viewed as an attempt to introduce “social” pricing attributes.

Disadvantages:

- Implementation could be complicated if existing rate structure does not allow for simple conversion;
- Has potential for revenue instability compared to non block methodologies;
- May pose difficulties in establishing appropriate usage block boundaries;
- May have substantial impact on high volume and highest-income users.

Fixed Charge with Volumetric Block Rates		
Fixed Charges - recurring <ul style="list-style-type: none"> • Some capital costs (e.g. debts service) • Portion of Fixed Operating Costs (e.g. administration, billing and collection) • Special Customer service Costs (e. g. meter reading, testing) 	Consumption Charges <ul style="list-style-type: none"> • Variable Operating Costs (e.g. materials, energy) • Portion of Fixed Operating Costs (e.g. production overhead, salaries of production overhead staff) • Portion of Capital Costs (e.g. salaries of construction workers, building materials) 	
<u>Charge per:</u> Account Meter size Pipe size Fixture units etc.	Usage Block 1 Consumption from 0- 30 m3 <u>Charge per:</u> m3	Usage Block 2 Consumption >31 m3 <u>Charge per:</u> m3

Demonstration of Volumetric Ascending Rate Calculation for Block 1 and 2

Calculation of Unit Costs by Customer Class

	Total	Residential	Budgetary	Other
Number of customers	68703	67678	159	866
Revenue requirement by customer class (in 000s)	10423	8453	682	1288
Less revenues from fixed charges (in 000s)	2189	1775	143	270
Net revenue requirements (000)	8234	6678	539	1017
Billed consumption (000 m3)	20565	17251	1392	1922
Unit rate per m3	0.400	0.387	0.387	0.529

Calculation of Rate for Block 1 (0- 30m3)

Customer Class	# of customers	Consumption in block 1 (000 m3)	% of total	unit cost	weighted block charge
Residential	67678	17100	88%	0.387	0.342
Budgetary	159	1380	7%	0.387	0.028
Other	866	900	5%	0.529	0.025
Total	68703	19380	100%		0.394

Revenue in Block 1 = 7630

Calculation of Rate for Block 2 (>31m3)

Customer Class	# of customers	Consumption in block 2 (000 m3)	% of total	unit cost	weighted block charge
Residential	67678	151	13%	0.387	0.049
Budgetary	159	12	1%	0.387	0.004
Other	<u>866</u>	<u>1022</u>	<u>86%</u>	<u>0.529</u>	<u>0.456</u>
Total	68703	1185	100%		<u>0.510</u>
Revenue in Block 2 =	604				

Water Rate

Monthly Fixed Charge (e.g. per account)		2.65/per account
Volumetric Charge		
Block 1	0 to 30 m3	0.39/m3
Block 2	> 31 m3	0.510/m3

- **Winter/Summer Rates/Peak Use Rates**

This rate methodology establishes rates that vary during different periods of the year. It attempts to encourage conservation in the summer months when demand for water is higher, especially for utilities that have high variations in seasonal and non-seasonal usage related to tourist and resort activities, gardening and lawn irrigation, swimming pools, etc. This rate may be structured in a way that two different rates are established between seasons, or there will be some base rate determined on the amounts of average annual usage during the whole year and a surcharge for peaking facilities that are only used during the season months.

The latter methodology attempts to recover the cost of oversized facilities and relevant operating peak demand costs from only those customers who actually place a burden on the system. If summer consumption is greater than a certain percentage (say 30%), the customer is charged a *peak use rate* (penalty). This type of methodology is attracting more and more jurisdictions because of the economic equity associated with this concept.

Advantages :

- May be attractive in the areas where the difference between average and maximum seasonal demand are significant;
- Generally accepted by customers;
- Can be structured to account for differences in cost of service among customer classes by setting up seasonal rates by class.

Disadvantages:

- Dependant on climatic conditions between season and non-season;
- Implementation can be difficult due to difficulties in forecasting demand, projecting impact of the structure on demand and, therefore, revenue;
- Impact high volume customers when moving from another rate structure;
- Highly dependent on availability of consumption information and establishment of appropriate meter reading cycles;
- Depending on the choice of design Unfair to those customers who do not peak the system and use a uniform amount each period.

Charges Based on Non-Metered Consumption

- **Equivalent Dwelling Units (EDUs)**

This concept is based on assigning the load of one EDU to a residential unit, and assigning every other type of customer a multiple of one EDU. The load is measured by common residential characteristics such as type of residence apartments or individual houses; number of rooms; square meters of the

residences etc. For commercial or other customers classes the load characteristics could be number of rooms, square meters, number of beds (hospital), number of seats (restaurant), etc. As an example, a grocery store establishment might be two EDUs, and a car wash facility might be six EDUs. The definition of an EDU can be made uniform so that all jurisdictions using this methodology can use the same loading characteristics for basic definition of EDUs. The benefit of this type of methodology is that there is empirical evidence supporting the different usage patterns of different types of business as compared to the average residential user. The weakness in this billing methodology is that there can be a wide difference in usage among residential accounts – all of which are billed at the same rate.

- **Fixture Units (number of water using appliances)**

The basis for this billing concept is that there is a correlation between the number of plumbing fixtures included in each premise and the amount of water/sewer usage. This billing concept requires the jurisdiction to count and keep a current record of the number of plumbing fixture units included in each customer's premise. The weakness of this methodology is that fixture units are often not a good measure of total usage, the methodology is difficult in implementation and administering.

- **Front Footage**

Under this billing methodology, there is assumed to be a correlation between the amount of front footage associated with a customer's property and the amount of water/sewer usage. It is self evident that there are weaknesses with this methodology and this type of methodology is rarely used.