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## **5 Main Results of EFS Development in EECCA**

### **5.1 The Municipal Water Services Sector in EECCA**

Country-specific analyses conducted in the years 2000-2002 using the EFS methodology and FEASIBLE have revealed and quantified several financial challenges that EECCA countries face in their efforts to keep up and improve the level of urban water and wastewater services. But at the same time these exercises have also helped the governments identify realistic and concrete steps to improve infrastructure services even under very tight budget constraints.

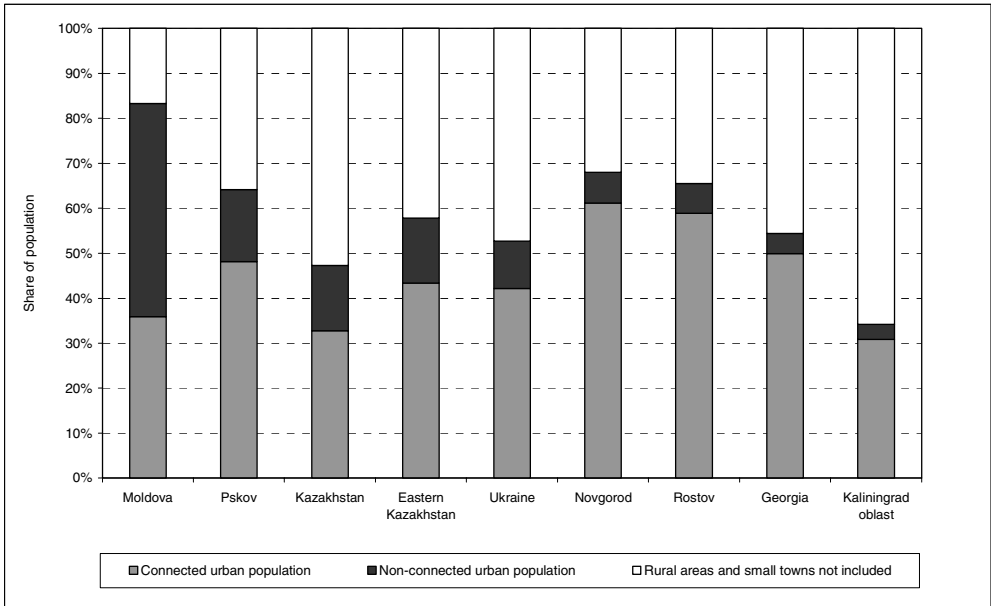
#### **Existing service level**

The EFS country studies included only the urban population<sup>9</sup>. The rates of urban population connected to centralised water supply and wastewater collection systems (75-95%) are often comparable with those in OECD countries. However, there are significant differences between and within the countries, as shown in Figure 5-1 below. Although the share of the rural population supplied by central systems has not been estimated, it is not expected to be high. Generally, the share of the total population connected to central water supply is between 30 and 60%.

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<sup>9</sup> In Novgorod, Pskov, Moldova and Georgia, this includes the population in towns with more than 1,500 inhabitants. In Kazakhstan, only the urban population in towns above 20,000 inhabitants is included, while in the Ukraine study, the limit is 10,000 inhabitants.

Figure 5-1 Share of population included in EFS studies and the connection rates to central water supply

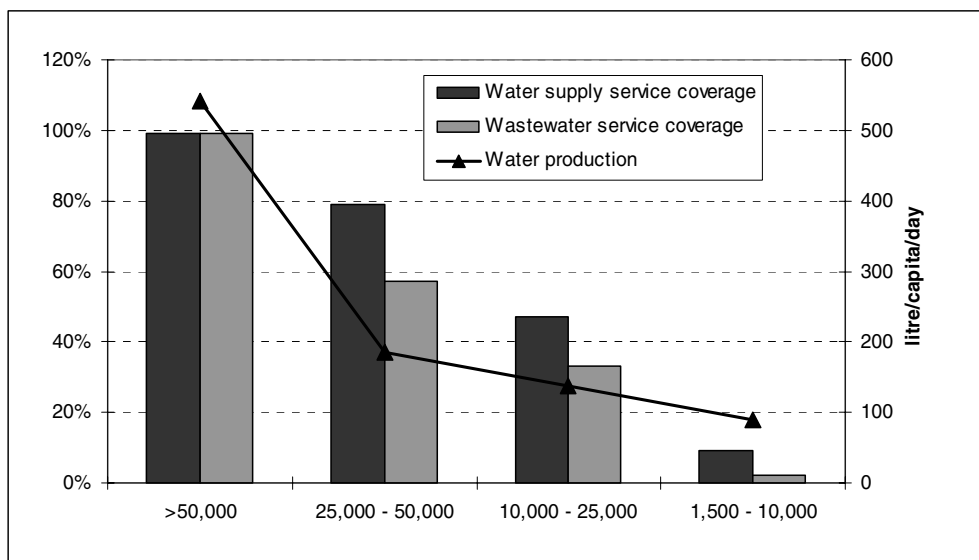


Source: Data collected within country and regional environmental financing strategies (EFS)

As regards wastewater collection, the connection rate is 10-20% lower than for water supply. Most of the large cities have biological wastewater treatment plants, sometimes with significant excess capacity.

The above figures for connected population are, however, average figures for the country and regions. Significant variation exists within the countries/regions depending on the size of the settlement. Figure 5-2, for example, demonstrates the distribution of the connected inhabitants to the centralised water and sewerage system in Moldova. The bars scaled against the left axis indicate that the coverage of both water supply and wastewater collection is 100% in the largest cities and significantly less in small towns. The line marked with triangles and scaled against the right axis shows the production of water per capita per day. It clearly illustrates excessive water production and losses in large cities. These two variables are shown on one diagram for convenience only. It should not imply that there is a correlation between them.

Figure 5-2 Coverage by centralised water and sewerage systems and consumption of water in Moldova



Source: Data collected for Moldova EFS

Typically, the infrastructure was usually inefficiently designed and, hence, it is very costly to operate and maintain. Especially, energy costs are excessive, accounting for up to 60% of the total operating costs (compared to 10-15% typically in OECD countries).

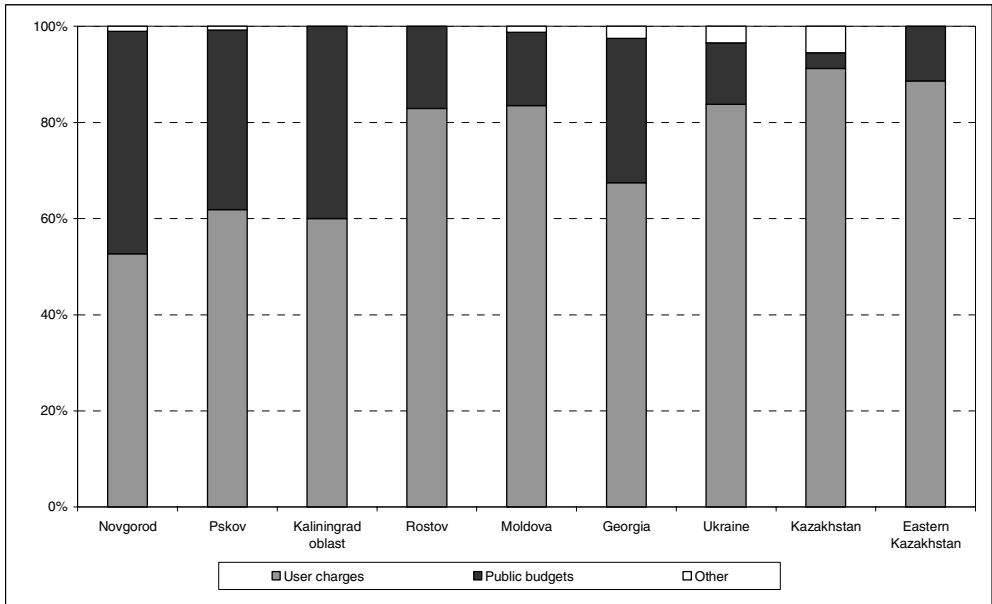
High water production contributes to excessive operating costs. There are high losses in the distribution system as a result of badly maintained supply systems, and over-consumption by end-consumers is also common. Tariffs are charged on the basis of norms and not on the basis of actual consumption, which implies that there is little incentive for the user to reduce consumption.

### Existing financing situation

User charges account for a varying share of the supply of finance: from about 50% in Novgorod, Russia, to more than 90% in Kazakhstan. The remaining funds for the water utilities come mostly from public budgets. The share of other resources such as bank credits, bonds, environmental funds, foreign grants and loans is marginal compared to user charges and public funds.

This situation reflects the degree of reforms in the water and wastewater sector - in particular, the extent to which cost recovery policies have been implemented. It also shows poor access to debt financing of water and wastewater infrastructure.

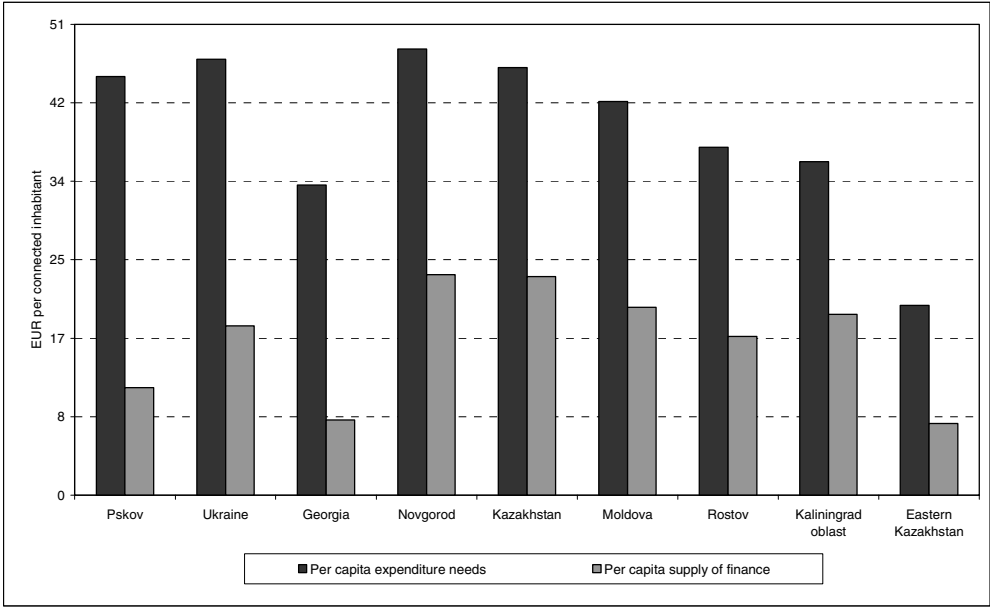
*Figure 5-3 Existing sources of financing water and wastewater utilities*



Source: Data collected within country and regional environmental financing strategies (EFS)

The key output of the EFS is the calculation of the cash-flow balances. That is, the difference between the estimated expenditure need and the baseline supply of finance. In Figure 5-4 below, the expenditure and supply of finance are compared. The expenditure need was estimated as the expenditure needed to operate, maintain and re-invest so as to keep the value of the existing assets constant.

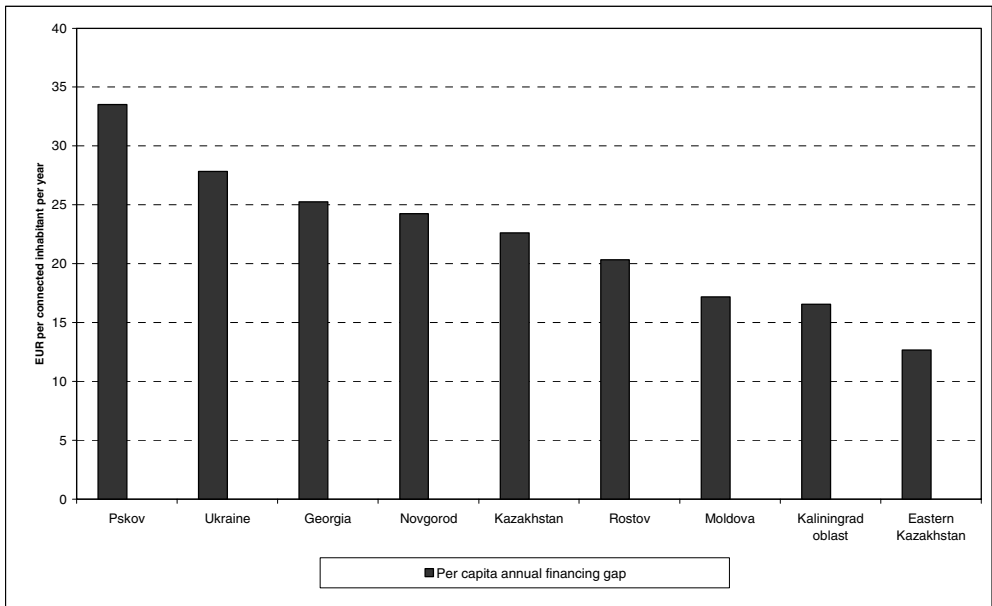
Figure 5-4 Expenditure need and supply of finance in EUR per connected inhabitant in the first year of the baseline scenario



Source: FEASIBLE, except Kaliningrad oblast for which individual model calculations are presented

In all countries, a significant financing gap was estimated even for the baseline scenarios, which did not include extensions of presently functioning infrastructure. Only around half of the necessary funds are being provided. In per capita terms the estimated annual additional funding requirements varies among countries and regions, from EUR 34 in Pskov to around EUR 15 in Eastern Kazakhstan (see Figure 5-5). It is also noticeable that there is significant variation within the countries. This is demonstrated by the comparison of the individual regions in Russia and by comparing the overall estimations for Kazakhstan with the assessment for the Eastern Kazakhstan region.

Figure 5-5 Financing gap per connected inhabitant on an annual basis (EUR), in the first year of implementation programme



Source: FEASIBLE, except Kaliningrad oblast for which individual model calculations are presented

Increasing the supply of finance to bridge the deficits could involve significant burdens on some countries in EECCA. In order to fully cover the operation and maintenance costs of the currently operating urban water infrastructure alone, Moldova would, for example, need to spend 3.2% of the current GDP, Georgia, 3.0%, and Kazakhstan, 1.2% per year. In all cases, this would imply doubling or tripling the current level of expenditure on the water sector. The cost burden on the economy appears heavy when compared with the estimates for the EU candidate countries in CEE. For example, it was estimated that Lithuania would have to spend from 1.0% of the GDP in 2005 to 2.6% of the forecasted GDP in 2020 to implement the entire body of environmental directives of the European Union (DANCEE/Anderson and Semeniene, 2001). These figures include annualised investment and O&M costs for all environmental directives including the drinking water and urban wastewater directives. A similar relative cost burden has been calculated for other accession countries, such as the Czech Republic (2.5% to 3.7% of GDP) and Poland (1.3% to 3.7% of GDP).

The additional payments for operations and basic maintenance would have to come from those financing sources that are available for such expenditures, i.e. practically only users and taxpayers (budgets). The users' charges in particular (as shown in Figure 5.3) have no realistic alternative as a source of covering regular operation and maintenance costs. The only alternative is a decrease of the level of service (Box 5-1).

*Box 5-1 Decreased level of service as an alternative to increase of users charges*

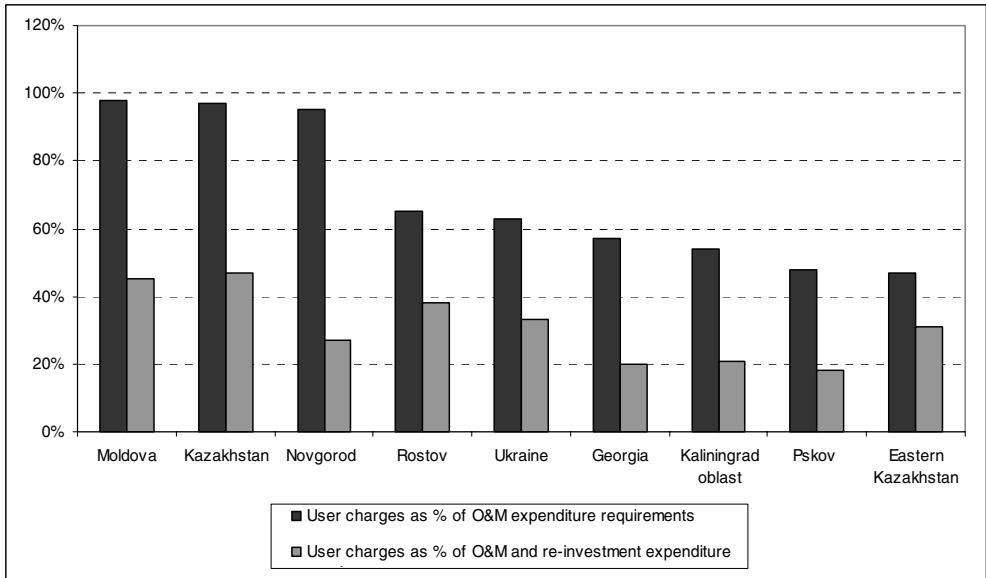
Cities in EECCA countries react to high operating costs by not operating the infrastructure or operating it unevenly. Water and wastewater services are often unreliable with frequent interruptions and low quality. In many cities, water is supplied only a few hours a day, and it is insufficiently treated. Most wastewater treatment plants are bypassed or provide only basic mechanical treatment, if any at all.

The most serious consequences are caused by the chronic shortage of funds for proper maintenance of infrastructure, such as small repairs, replacement of worn-out parts, small capital repairs and essential rehabilitation. This has initially implied a focus on breakdown maintenance (vs. preventive maintenance), and it has subsequently meant that the assets rapidly lose their economic value, physically fall apart and, finally, they get abandoned. In several cases, the infrastructure is so run down that there is a serious threat of complete collapse of the entire system if funds for maintenance and rehabilitation are not provided.

In the Soviet times, the excessive costs were subsidised in many ways – directly from the budgets and indirectly, e.g. by providing energy below cost price. Over the last decade, the user charges have not caught up with the rapid liberalisation of input prices (e.g. of electricity and chemicals), and they have not made up for budget expenditure cuts. In many cities, user charges do not even cover the cost of operating the remaining, partly functioning infrastructure. Among the countries and regions studied, only Moldova and Novgorod, on average, charge users almost full operating costs, but collected user charges nowhere cover more than half the costs of both operating and maintaining existing assets (please refer to Figure 5-6 below). Some variation within countries is also present. While the average for Kazakhstan demonstrates that user charges cover close to all operating costs, in Eastern Kazakhstan, they are only able to provide financing for half of the total operating and basic maintenance expenditure need.



*Figure 5-6 Collected user charges as % of expenditure needed in the first year of the baseline scenario to properly operate infrastructure (only what was in use) and maintain the present service level*



Source: FEASIBLE, except Kaliningrad Oblast for which individual model calculations are presented

Capital investments have been rare and mainly in emergencies reflecting the focus on breakdown maintenance. Furthermore, they have not always been allocated strategically to improve the efficiency and sustainability of services. A few large cities have, however, embarked on more strategic capital improvement programmes, usually with foreign financing.

### **Policy options to close the financing gap**

Given this situation, just maintaining the present, very low level of water and wastewater services, although this may not look ambitious as a policy objective, would impose significant cost burdens on the countries studied.

The EFS studies examined many alternative policy options before making a recommendation as to which financing strategies can be implemented. The alternative options analysed can be bundled into three main groups:

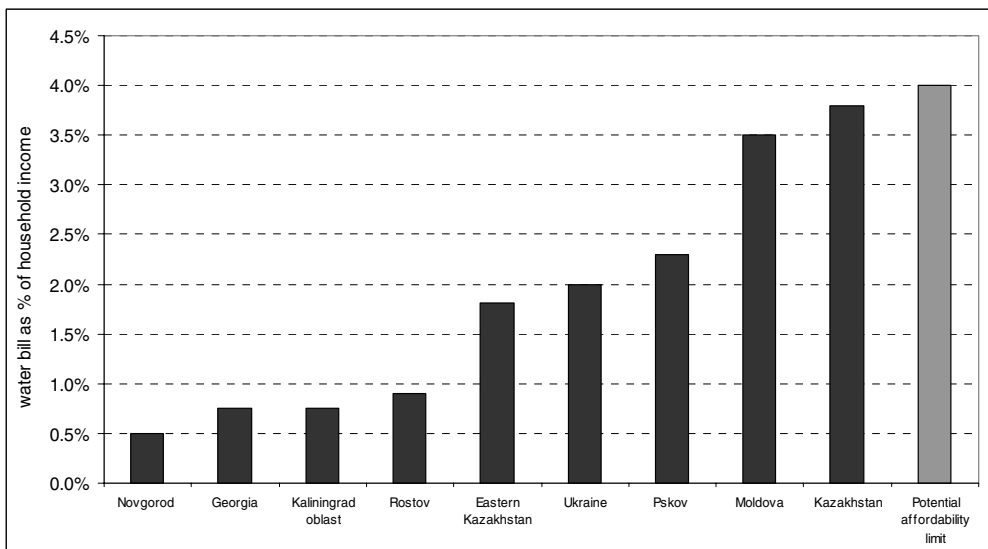
- Cost savings through efficiency improvements.
- Increased supply of finance.

- Decreased service level ambitions.

The current high energy consumption implies room for substantial *cost savings*. Thus, targeting the scarce maintenance and re-investment funds to achieve such cost savings was identified as one of the most important measures.

Simulations of various *options to increase the supply of finance* to cover the operation and maintenance gap have shown that user charges are the only realistic long-term source of finance for these expenditure categories. Most households seem to be able to pay more than they actually do. In several countries studied, the average charges paid for water and wastewater as a proportion of average household income (0.5-2.5%) are well below international benchmarks for countries of similar income levels (typically 3-5%). On the other hand, Kazakhstan (on the country level) and Moldova are recovering a much higher share of costs from households, with charges approaching the limits of what the households can probably afford ( Figure 5-7 below).

Figure 5-7 Water bill as percentage of average household income

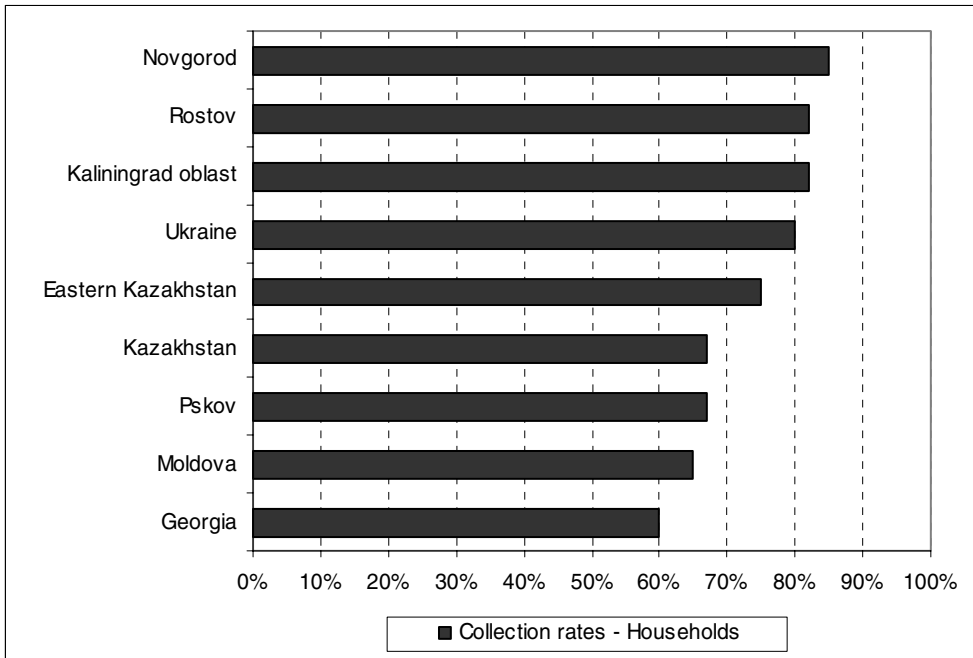


Even in the countries and regions that impose relatively moderate charges on users, affordability is a serious problem for a relatively small share of the population (10-20%). These most affected social groups are also often well defined,

e.g. pensioners, disabled, deprived suburbs. Thus, there seems to be significant room for reform of the existing all-inclusive subsidy schemes. Replacing them with more targeted support for specified social groups also seems to carry a potential for overall savings in public budgets<sup>10</sup>.

Another reform, which has been considered as part of an environmental financing strategies analysis was related to restrictive tariff setting policies and poor financial management and collection procedures of water utilities. In several countries average collection rates are as low as 60-70% of billed amounts. Strengthening of the payment discipline has been shown to generate substantial additional funding in itself (see Figure 5-8 and Figure 5-9).

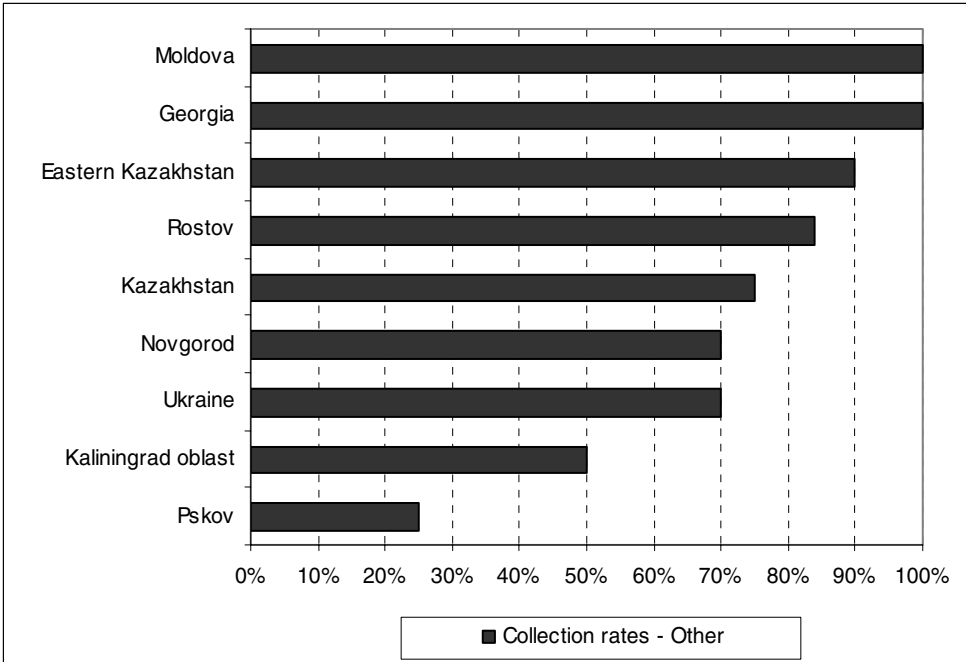
*Figure 5-8 Collection of user charges from households*



Source: Data collected within country and regional environmental financing strategies (EFS)

<sup>10</sup> See “Affordability, social protection and public participation in urban water sector reforms in EECCA: Key issues and Recommendations” OECD/EAP Task Force, 2003

Figure 5-9: Collection of user charges from other customers



Source: Data collected within country and regional environmental financing strategies (EFS)

Public sources of financing, albeit scarce, will have to play an essential role in leveraging financing for capital investments for rehabilitation and major development of the infrastructure. There are no substitutes for public funds to provide social protection of poor and vulnerable groups and to facilitate access to debt financing. However, in order to play these roles effectively, budgetary funds and donor grants need to be strategically concentrated on fewer priority programmes. These programmes no longer need to include immense investments, but rather modest rehabilitation of strategic parts of the system that bring about operational efficiency and cost savings. In some countries, for example in Kazakhstan, public expenditure on water and wastewater infrastructure has been particularly dramatically constrained, partly due to the government policy to encourage full cost recovery at the local level. The study has shown that such an ambitious policy, while having several merits, will be difficult to sustain in the medium and long run if infrastructure development targets are to be achieved.

International financial institutions (IFI) will continue to have an important role in relation to capital investments. For many years to come, they will be a major source of long-term financing in EECCA. Furthermore, they provide an important demonstration and catalytic function, and introduce engineering, financial and management discipline into project management, paving the way for greater reliance on debt financing for capital improvements.

In EECCA, the private sector will most likely only play a limited role in the foreseeable future in financing water infrastructure (depending on a country risk profile). Domestic and foreign direct investments in the sector will remain constrained by the low incomes and high risks caused by several institutional and policy obstacles. For several years, the main value added by the private sector will, therefore, be improved management practices and efficiency of operations (e.g. billing, customer relations), rather than financing.

The *option of decreasing the service level* was considered only in few cases. As the service level is already low, this alternative is politically undesirable. This alternative may also be financially self-destructive. It would be difficult to mobilise public support for tariff increase and for major reforms announcing that the service level would be even lower. People are willing to pay more for infrastructure only if they see that the level or quality of services improves. However, without a concentrated effort both to improve efficiency and to increase the supply of finance in selected places, a de facto deterioration of the service level will be the result across most cities.

## **5.2 Policy Impacts of EFS Development in EECCA**

Environmental financing strategies are inputs to the strategic planning process. Therefore, the main impact is long term. However, the financing strategies prepared so far have already achieved significant short term policy impacts:

- The EFS has been adopted as a basic policy document in almost all the case countries.
- The EFS has changed the investment priority programmes in several cases.
- The EFS has promoted policy change regarding tariff setting and water demand policies and reforms of unrealistic standards.

- The EFS has been used by donors in the reformulation of water sector programmes.

First of all, the financing strategies have been adopted as one of the key policy documents in the water and wastewater sector with findings and recommendations being used when new policy in the sector is developed.

In the countries and regions where the beneficiary organisation is responsible for investment planning, the results of the EFS have been incorporated in the public investment programmes. In those cases where the responsibility for investment planning is divided between various levels, the impact has been less significant.

For other types of policy such as tariff setting where the responsibility is, usually, at the local level, the EFSs have had an indirect effect in highlighting the importance of tariff reforms for the stakeholders.

A significant short-term impact has been that the EFS has been used by donors as an instrument to change the focus of their water sector programmes. For example, DANCEE now supports only projects that are in line with the strategy, which has meant a change of focus from service extension projects to efficiency improvement projects, such as energy efficiency.

However, it must be kept in mind that the impacts seen so far are mostly of a visible, short-term nature given the relatively short span of time in which the EFS methodology has been applied. Changes in policies, procedures, institutional and organisational structures are long term by nature. Likewise, the more indirect impacts, such as changed perceptions of government officials stemming from training and working with EFS methodologies, are difficult to capture and are only likely to have a visible impact in the longer term.

Based on the EFSs developed so far, three factors have been particularly important to achieving a wider impact of the EFS:

- Ability to mobilise the key stakeholders and to ensure their leadership and ownership of the process of developing the EFS.
- Timing and co-ordination with other sector planning initiatives and budgeting procedures in the relevant country/region. Clearly, the potential impact of a financing strategy can be much greater in a country where a reform

process is already underway, and where the stakeholders know what to do with it.

- Co-ordination between governments at different levels (national, regional, local). This is important as in many EECCA countries local governments have full responsibility for providing municipal services and developing the municipal infrastructure, including capital investments planning.

*Box 5-2 Overview of policy impact*

The environmental financing strategies for water supply/wastewater treatment have resulted in a number of policy impacts:

- In Moldova, the authorities wanted to verify how feasible it would be to implement very stringent wastewater effluent standards stipulated by national post-soviet legislation. The analysis demonstrated that compliance with these standards is so expensive that it would be impossible to finance over the next 20 years, even under the most optimistic assumptions about growth of user fees, income, public sector revenues and financial markets. This triggered the Ministry of Environmental and Natural Resources to prepare a draft government resolution relaxing municipal effluent standards to the levels of the EU urban wastewater treatment directive.
- In Novgorod Oblast, at the initiative of the Regional Committee for Environment Protection (Goscomecologiya), the WS/WW strategy was adopted as the major policy document of the Regional Administration. Priority investment projects identified through FEASIBLE analysis that provide major contributions to strategic targets were included in the regional "Action Plan on Environmental Protection and Effective Nature Use for 2001-2004".
- In Pskov Oblast, the first round of policy dialogue between different departments of the Oblast Administration, supported by FEASIBLE simulations, has not generated any feasible scenarios. Financial authorities and experts could not agree on the radical measures that would be needed to increase supply financing of water and wastewater infrastructure to the levels covering costs of ambitious extension of services proposed by the environmental authorities. But simulations revealed very low levels of user fees compared to other Russian regions. This has prompted the regional administration to issue recommendations on procedures for calculation and approval of municipal services tariffs and improvement of many existing weaknesses of the tariff policies applied in the cities. Furthermore, they have insisted more firmly that local administrations follow the schedule for achieving full cost recovery through household tariffs for municipal services.
- In Kaliningrad Oblast, the environmental financing strategy is being used to develop a

medium-term development plan for the oblast with the overall aim to promote better use of public resources.

- In the Ukraine, the national financing strategy was used to support the financial analysis of the wider water sector strategy of the government, thus becoming an essential part of the government's sector planning.

Furthermore, the recent environmental financing strategies for municipal solid waste have also had impacts:

- In Novgorod Oblast, the financing strategy has facilitated a substantial revision of regional waste management plans and revealed many options for consolidation of the planned landfills and waste processing facilities to reduce costs by achieving economy of scale. The analysis has also identified a package of policies that can reduce the demand for landfills and identified three priority capital investment projects, all involving inter-municipal co-operation.
- In Yaroslavl Oblast, the financing strategy was used to identify waste management development options, and it has triggered a debate on restructuring the waste management company. The financing strategy analysis found that the waste management systems in the large cities of the Yaroslavl region already generate a financial surplus even at current, affordable levels of tariffs, and could, thus, potentially support private sector participation
- In Rostov Oblast, the regional environmental committee is trying to use the financing strategy to strengthen its negotiating position in the bargaining with the regional finance administration over the annual budget and to argue for co-operation between local governments in developing cheaper regional solutions.



## **5.3 Urban Water Supply and Sanitation - Ukraine Case Study**

### **Introduction**

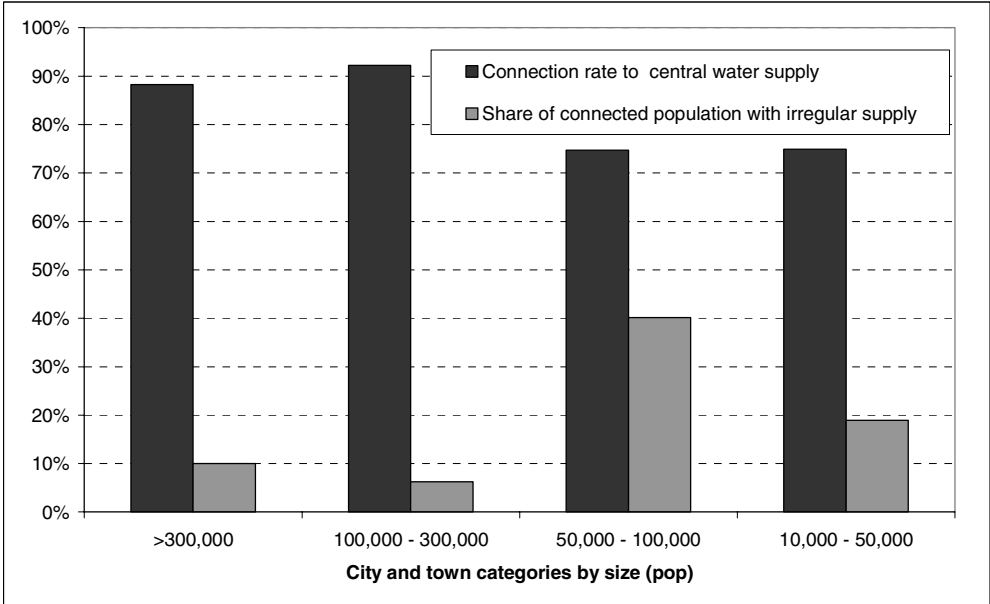
The current state of the water and wastewater sectors in Ukraine is critical. Existing infrastructure assets continue to deteriorate without proper maintenance; service levels are poor in terms of quality, safety and reliability; operational practices are highly cost-inefficient; management systems and resource allocation are inadequate and mostly directed to day-to-day operation/emergency liquidation activities rather than strategic development and planning. Based on the survey data from water utilities, it was assessed that about 50% of all the assets are already worn-out and need to be replaced. Unless a properly structured and realistically planned urgent restructuring programme is designed and implemented, the entire system of service delivery is likely to collapse with a corresponding negative effect on public health and overall poverty reduction efforts.

The environmental financing strategy methodology has been developed to address all of these problems through detailed review/quantification of existing problems and analysis of alternative scenarios of development. The important feature of Ukraine's EFS is that it has been going on in parallel with the National Water Sector Strategy and Action Plan project financed by DANCEE. Thus, the EFS has been used as a tool in the financial analysis of the sector and development of alternative scenarios.

### **Existing situation in water and wastewater services**

The connection rate to a centralised water supply network is rather high and ranges from 92% in large cities to 75% in smaller towns (10,000 - 50,000 inhabitants). About 19% of households are affected by scheduled water supply (see Figure 5-10). As far as water losses are concerned, they are significant and average about 30% of all water supplied through the distribution network. The actual figure could be even higher, since additional loss may be hidden in the excessively high consumption norms. About 50-70% of cities and towns receive water of acceptable quality by European standards. In 30-50% of cities and towns, the quality may be improved by implementation of an asset rehabilitation programme. In about 10-15% of cities and towns, major infrastructure redesign and renovation are required to achieve acceptable standards.

Figure 5-10: Water supply coverage and regularity



Source: Data collected for the Ukraine EFS

The share of urban population connected to a centralised wastewater system ranges from 45% in small towns to 85% in large cities. The overall system components, including pipes, collector, and treatment plants, are in a very poor condition. Most of the wastewater treatment plants were established in the period from 1960 to 1980. The age of plants ranges from 7 to 48 years (with an average of about 25 years) and most are currently in operation. The method of wastewater treatment is also subject to variation depending on the size of the town. Based on the collected data it was estimated that, in cities with a population above 100,000, the mechanical-biological method is actually used to treat about 80% of wastewater. In the smaller towns, the average is about 45%.

**Available finance**

The structure of the finance available to the water sector in the Ukraine (see Figure 5-11) does not significantly differ from that in other countries and regions considered within the EFS programme. User charges from households, industrial/commercial entities and budget organisations represent, by far, the largest share of total funds available to water utilities. In 2003, the billed user charges from the customers covered by centralised systems were estimated at EUR 426

million. With an average collection rate for households at 80% and a similar rate for non-households at 70%, the cash proceeds from all users is estimated at EUR 316 million. Households account for approximately 46% of this amount. Depending on the range of estimated per capita income expenditure levels, the total household charges effectively translates into the monthly water bill accounting for approximately 1.6-1.9% of the monthly household income<sup>11</sup>.

A total of EUR 48 million was available for water utilities from public budgets in the year 2000. It accounts for approximately 0.4% of the average consolidated public expenditure, or 0.15% of the GDP. This amount includes operational subsidies from national and local budgets in compensation for affordability constraints and discounts for privileged groups. A small share of the funds is used for maintenance and rehabilitation investment programmes.

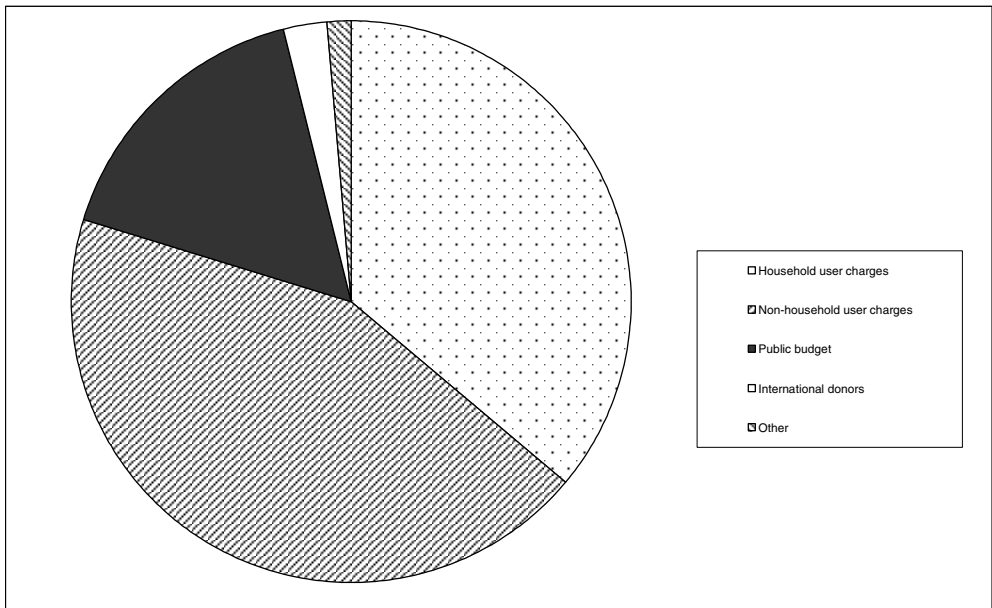
With regard to environmental funds, 56% of their expenditure is directed to water-related projects. The absolute amount of such funds is, however, small, making their overall contribution to capital investment in the water sector only of marginal nature. In 2003, the total financing for water projects from the environmental funds system was estimated at EUR 10.4 million.

The aggregate data on sector financing by international financial institutions and donors were not readily available. It is evaluated, however, that the total amount of IFI and donor loans/grants does not exceed 0.1% of the overall expenditure needs. The cumulative amount of water project funding committed from foreign sources was estimated to be in the range of EUR 100-109 million. While committed, not all of these funds have been disbursed yet. In addition, annual disbursement levels are very difficult to assess. Therefore, Figure 5-11 below shows only an indicative estimate of the international financial institutions and donor support to the water sector in 2003.

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<sup>11</sup> Household expenditure data have been used as a proxy for income levels

*Figure 5-11 Sources of financing for water and wastewater utilities operation and investment in Ukraine (2003)*



Source: Estimates on the basis of historical data collected for the Ukraine EFS

### **Baseline scenario results**

Table 5-1 provides a summary of the baseline expenditure needs, available supply of finance, share of the needed funds provided by diverse financing sources, and remaining financial gap and maintenance backlog. It is important to note that the profile of expenditure needs in the baseline scenario includes a rehabilitation programme designed to address a large backlog of maintenance from the past during the period 2004-2011. The rationale is that most of the assets under this programme are in the "near-to-collapse" state, and renovation needs were classified as "urgent". Further postponing their rehabilitation will lead to increased disruptions of the quality and quantity of services, further deterioration of assets and eventual collapse of the entire system.

*Table 5-1 Baseline scenario of annual expenditure needs, supply of finance, financial gap and accumulated maintenance backlog, EUR million*

	2003	2004	2005	2006	2007	2010	2015	2023
Total expenditure need	963	1,565	1,590	1,629	1,666	1,766	1,229	1,336
Total supply of finance	392	522	423	438	452	491	562	642
Baseline Financing Gap	572	1,043	1,167	1,191	1,214	1,274	667	694
<i>Supply of available finance as % of expenditure need</i>	41%	33%	27%	27%	27%	28%	46%	48%
<i>User charges as % of operating expenditure</i>	61%	61%	62%	63%	64%	66%	69%	71%
<i>User charges as % of operating and maintenance expenditure</i>	33%	33%	33%	33%	34%	34%	35%	35%
<i>Maintenance backlog accumulated since the base year (2003)</i>	383	679	1,093	1,518	1,953	3,305	5,711	9,820

Source: Draft report, Environmental Financing Strategy for the Municipal Water and Wastewater Sectors in the Ukraine, Background analysis

Model calculations for the baseline scenario demonstrate a significant shortage of funds. The total annual supply of finance, not to mention user charges alone, is insufficient to cover even the operating costs of the services. User charges, on average, provide only 65% of the operating expenditure needs and less than 35% of operating and maintenance (O&M) costs. The cumulative maintenance gap reaches over EUR 9 billion by the end of the period. This is clearly not sustainable and indicates that further significant depletion of network infrastructure and assets can be expected if no changes in policies are made.

### **Operating safety scenario**

The scenario of full EU compliance by 2010 has been analysed to understand the extent of the costs involved and the financing/investments required. It suffices to say that for only a rehabilitation programme and new investment, excluding operating costs, additional funds in the amount of 2% of the annual GDP will be required (average of EUR 1 billion in additional funds for the period from 2003

to 2012). It is difficult to envisage the availability of such funds during the next decade. As a result, an alternative scenario has been analysed that ensures that the water supply system is brought to a level where operations can be run smoothly and safely. This is achieved through the implementation of a rehabilitation programme that is similar to the one of the baseline scenario. However, in the baseline scenario such a programme could not have been carried out due to limitations on finance available. In the operating safety scenario, additional funding generated through modelled policy changes makes partial implementation of the rehabilitation programme possible. As a result, water loss savings, demand reduction and reduction of infiltration, as well as investment in more energy efficient equipment, result in reduced operation costs and some reduction in capital repairs in the longer term.

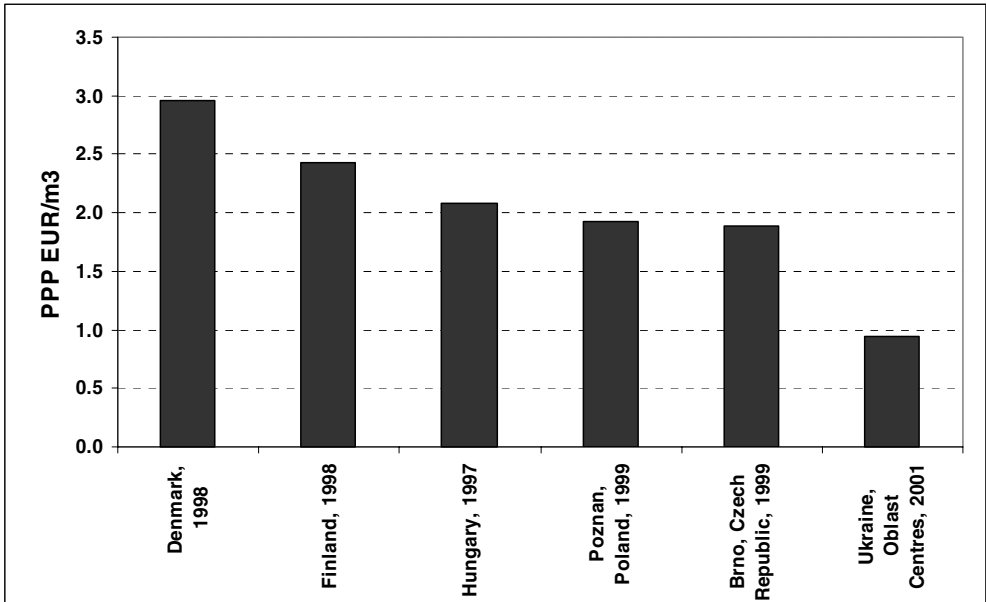
Among alternative policy instruments, revision of the existing tariff setting and regulation policy to achieve full cost recovery together with improvements in payment discipline (increased collection rates) appears to be most effective. Figure 5-12 presents current levels of the average PPP<sup>12</sup> water tariff in Ukraine in comparison with other countries. This tariff rate translates into a monthly water bill that makes up about 1.6-1.9%<sup>13</sup> of the average household's personal monthly expenditure. A gradual increase in the average household water bill to the level of 4% affordability by the year 2007 and further retaining them at that level will provide a growing profile of user revenues to the sector. Assuming that subsidies are provided to low income families through a direct cash assistance programme, such tariff increases are assessed to be feasible.

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<sup>12</sup> These figures differ from actual, observed tariff levels in countries, as they are corrected to account for Purchasing Power Parity (PPP).

<sup>13</sup> In calculating these figures actual, observed tariff levels rather than PPP corrected tariffs have been used.

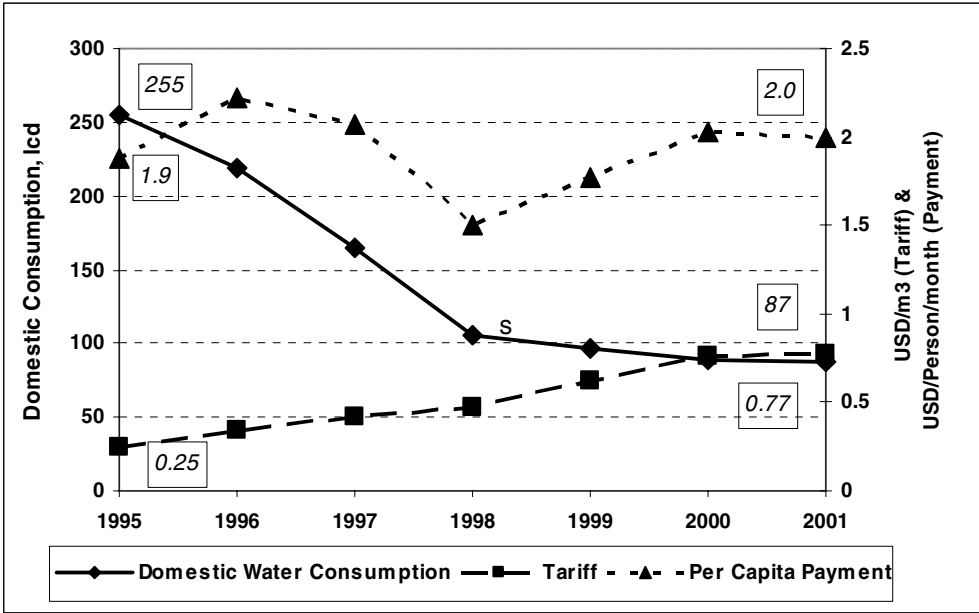
Figure 5-12 *Tariff levels in selected countries / cities (PPP EUR/m<sup>3</sup>)*



Source: COWI analysis of diverse country reports and datasets

Furthermore, experience from earlier environmental financing strategies, as well as analysis of tariff increases in comparable countries, demonstrate that a significant reduction in water consumption typically follows increases in tariffs. As a result, the variations in the final bill to households are not significant (see Figure 5-13, for the example, from Klaipeda, Lithuania).

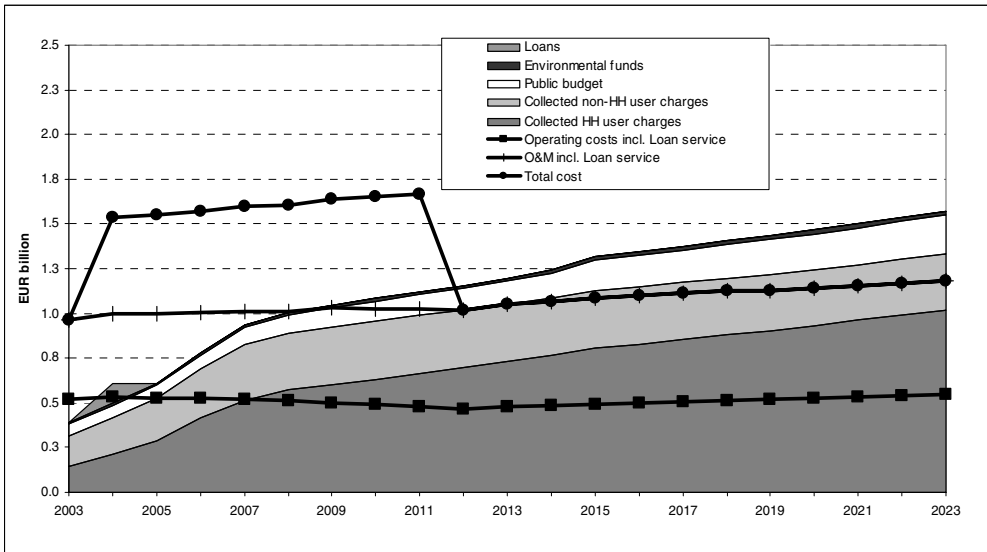
Figure 5-13 Tariff, water conservation and resulting cost to consumer, Klaipeda 1995-2001



For non-household customers, tariff rates have been presumed to fully cover the corresponding share of O&M costs by 2007 and stay at that level thereafter. A moderate increase in budget funds for the sector - from the current level of 0.4% of public expenditure to 0.5% in the medium and 0.6% in the long-term perspective - have also been assumed in these scenario calculations. In addition, the share of public expenditure in GDP is assumed to be fixed; thus, the absolute levels of public expenditure will grow with the rate of annual GDP growth. All of these modelled policy measures result in additional funds available to the sector. It helps to substantially reduce the financing gap; however, a large financial deficit, especially in short-to-medium term, remains (see Figure 5-14).



Figure 5-14 Operating safety scenario expenditure and supply of finance, EUR million



Source: Draft report, Environmental Financing Strategy for the Municipal Water and Wastewater Sectors in the Ukraine, Background analysis

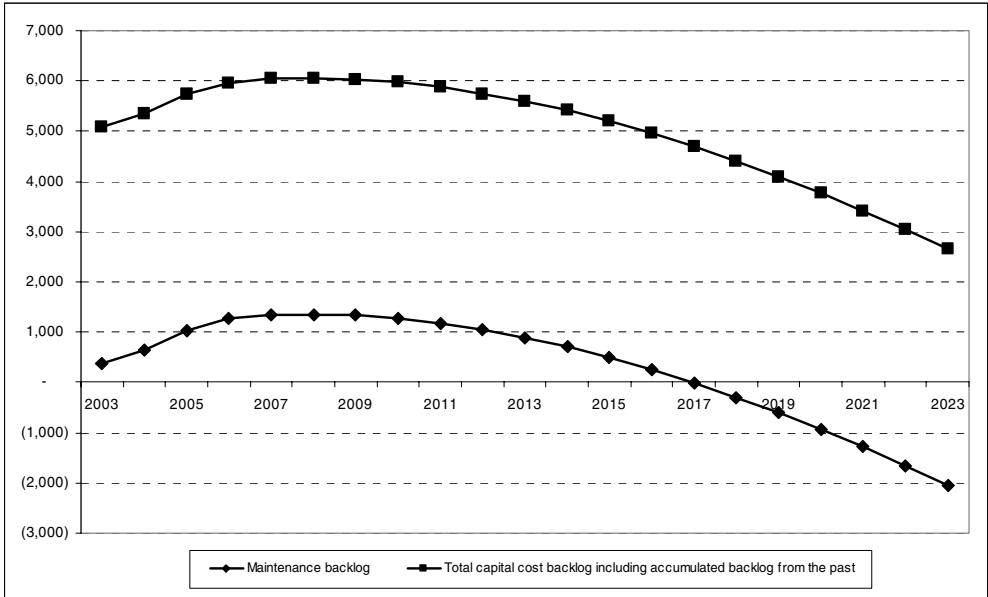
On current bases (in the same year) the total collected user charges fully cover the operating expenditure already in 2005. The total current finances available fully cover current operation and maintenance costs by the year 2009. Moreover, the area above the O&M curve after 2009 represents surplus of financing available and is growing over time<sup>14</sup>. It could, potentially, be used to close the maintenance backlog accumulated from the base year (2003).

However, a substantial gap in terms of total expenditure needs remains. The maintenance gap accumulated since the year 2003 can be closed within this scenario only in 2018 (see Figure 5-15, lower line). However, capital investment needed to address the urgent infrastructure, and asset rehabilitation (basically the accumulated backlog from the past) could not be financed in forecasted future under assumptions of supply of finance used in this scenario (see 5-15, higher

<sup>14</sup> The main source of such surplus is the increasing user charges. It has been assumed that household user charges will reach the 4% affordability rate by 2007 and stay at that level. This provides the water sector with future funds to finance backlog of maintenance, short- and medium term borrowings and potential private investments.

line). The policy changes envisaged in the Operating Safety scenario are not sufficient to close the total capital cost backlog, which includes keeping up with neglected maintenance needs and new capital investments in rehabilitation.

Figure 5-15 Maintenance backlog accumulated since 2003 and total capital cost backlog (including the backlog from the past), EUR million



Source: Draft report, Environmental Financing Strategy for the Municipal Water and Wastewater Sectors in the Ukraine, Background analysis

In absolute cumulative terms, the additional financing need amounts to EUR 6.2 billion until 2012 or an average of EUR 690 million annually for the same period. It makes up approximately 1.2% of the average annual GDP forecasted, or 3.4% of the average annual consolidated public budget expenditure. Increases of budget financing to such levels will most likely be difficult, if not un-feasible. Alternatively, foreign loans could be used to provide the needed expenditure. However, while it could help to reduce the gap partially, the financing surplus of future years indicates that it will be difficult to generate enough funds to service the foreign borrowing required to close the entire rehabilitation and extension programme needs.

**Supply of finance profile scenario**

The policy changes which resulted in substantial increases in the supply of finance did not provide the necessary funding to meet all expenditure needs envisaged by the operating safety scenario. The main reason for the remaining funding gap is the investment requirements for the rehabilitation programme designed to address previously un-maintained assets (backlog of maintenance from the past). As mentioned earlier, most of those assets are in the "near-to-collapse" state and are classified as "urgent". Further postponing their rehabilitation will lead to increased disruptions of the services.

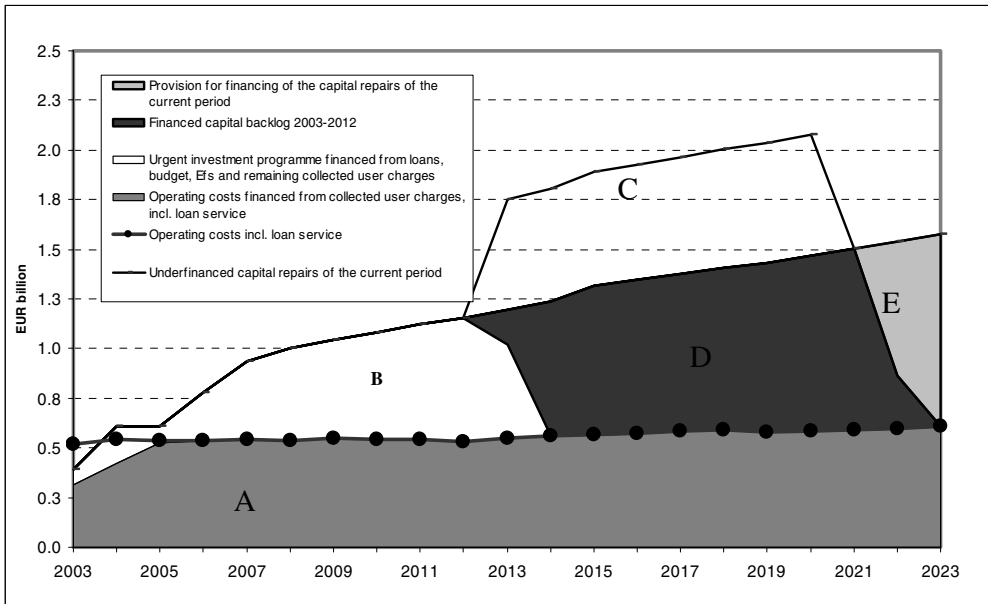
In these circumstances, the possible option could be to accept the supply of finance profile and design an investment programme that prioritises annual expenditure needs to fit the funding profile constraint. In other words, such a scenario would address real practice situations when, facing a significant shortage of funds, utility management will, most likely, direct available funds to rehabilitation of the urgent parts of the network, rather than allocate them to planned routine current maintenance work. A possible structure of such prioritisation plan could be as follows:

- Throughout the whole period, user charges could initially be used to cover operating costs.
- Any remaining surplus from user charges could then be directed to address rehabilitation programme needs, rather than immediate current asset maintenance.
- In these circumstances, however, current asset maintenance is accumulated as a backlog of maintenance and postponed to later years until the rehabilitation programme has been completed.
- Once the rehabilitation programme has been completed, the available funds could be used, in the order of priority, to cover operation costs, maintenance backlog from the early years of strategy implementation, and, lastly, normal maintenance of the current year.

It is important to note, that implementation of such a strategy will inevitably lead to total expenditure increase. This is due to postponing current maintenance, which will inevitably result in further deterioration of the assets and will increase their total maintenance/rehabilitation cost in the future. Model calculations for Ukraine suggest that such expenditure needs for the period 2004-2012, when postponed by 10 years, will increase in total by 25%. However, when substantial

shortage of funds persists even after accounting for all realistic measures to increase supply of finance, such prioritisation option could be the only realistic scenario allowing necessary funds for urgent rehabilitation programmes. The implementation of such a programme is depicted graphically in Figure 5-16.

Figure 5-16 Supply of finance profile scenario



Source: Draft report, Environmental Financing Strategy for the Municipal Water and Wastewater Sectors in the Ukraine, Background analysis

In this scenario option, user charges are used first to close the operating cost needs. All the remaining sources are then directed to the rehabilitation programme (the B area on the figure), which is completed by 2014. Starting from 2012, resources are gradually allocated to closing the maintenance backlog of early years of restructuring (area D). While the backlog continues to be closed in subsequent years, another backlog of maintenance for the years 2012-2023 accumulates (area C) which it is then only possible to address starting from 2021. The iterative process continues until all the past maintenance backlogs are fully closed, and normal maintenance of the current year becomes possible.

## Conclusions

The Ukraine water and wastewater sector faces significant shortage of funds. Analysis of existing problems and review of recent developments allowed identification of policy measures that could help to remedy the situation. Among others, such measures include:

- Necessary increases in the current user tariffs towards full service cost recovery levels alongside with the targeted cash assistance schemes to make services affordable for low-income groups.
- Improvements in the payment discipline (collection ratio) among all customer groups.
- Increased budget funds and their re-direction from providing operating subsidies towards more specifically targeted infrastructure rehabilitation programmes.

However, the extent of accumulated urgent rehabilitation needs is so large, that even a substantial supply of finance increase due to modelled policy changes, did not close the financing gap. Significant shortage of finance, especially in the short to medium-term period, remains. As a result, a scenario of expenditure prioritisation is proposed where allocation of current funds is targeted towards implementation of a rehabilitation programme. It, inevitably, results in long-term additional costs, as the current maintenance is postponed. Unless, however, a substantially higher amount of budget funds and foreign assistance resources becomes available, such a prioritisation option could appear to be the only realistic option for Ukraine's water sector development.

## 5.4 Municipal Solid Waste Management - Novgorod and Yaroslavl Case Studies

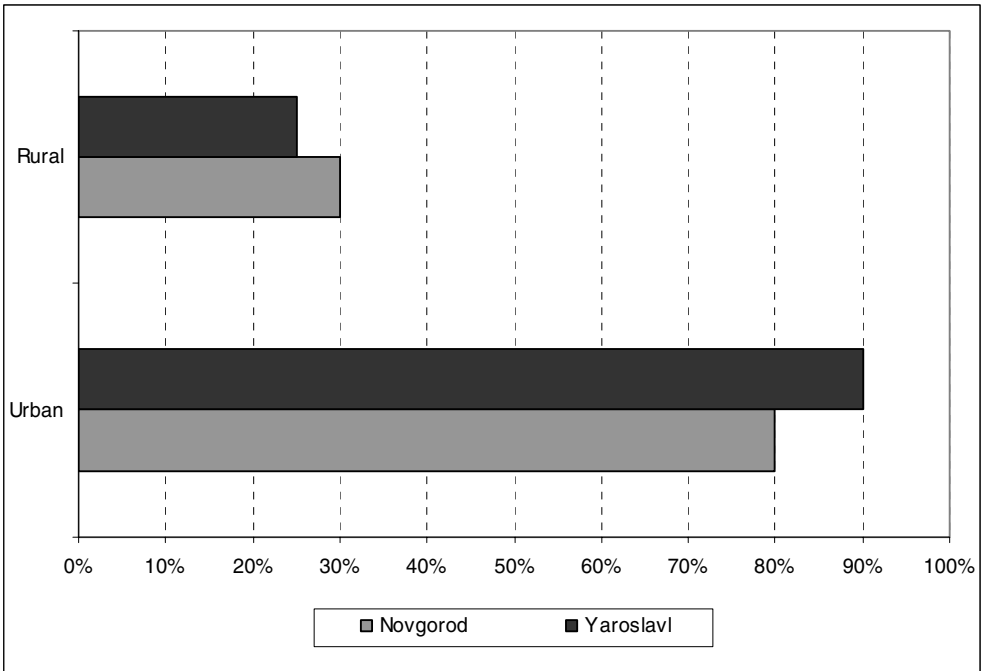
At the time of preparing this publication, the experience concerning the development and implementation of financing strategies for the municipal solid waste sector was still limited. Three case studies have, so far, been carried out using a pilot version of the MSW component of FEASIBLE version 2 - two in the Russian Federation regions of Novgorod and Yaroslavl and one in Latvia. In this chapter, the results of the EFS studies in the Russian regions are presented. An account of the Latvia study is provided in Chapter 6.1.

**Existing Situation in Novgorod and Yaroslavl regions**

The management of solid waste, particularly municipal solid waste, presents a major challenge across all regions of the Russian Federation. In most cities and towns, waste management practices are outdated in terms of both collection and disposal methods. There are urgent needs for upgrades and improvements with regard to waste collection coverage, levels of recycling and disposal facilities.

There is significant variation in population coverage by waste collection services. In large cities and towns, it is typically around 80-90%, while in the rural areas, the average coverage is in the range of 20-30% (see Figure 5-17). In addition, even in the urban areas, many of the private single-family housing regions are poorly covered or not covered at all by organised waste collection systems.

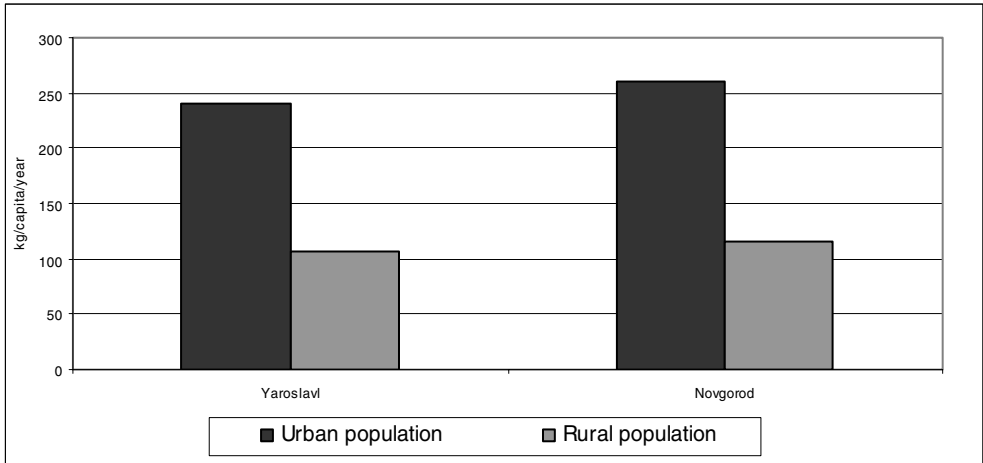
*Figure 5-17 Averaged population coverage by MSW collection system in urban and rural areas*



Similar variation exists with regard to waste generation. It is assessed that, on average, per capita municipal waste production in urban areas is more than twice the corresponding figure for rural regions (Figure 5-18). These figures should,

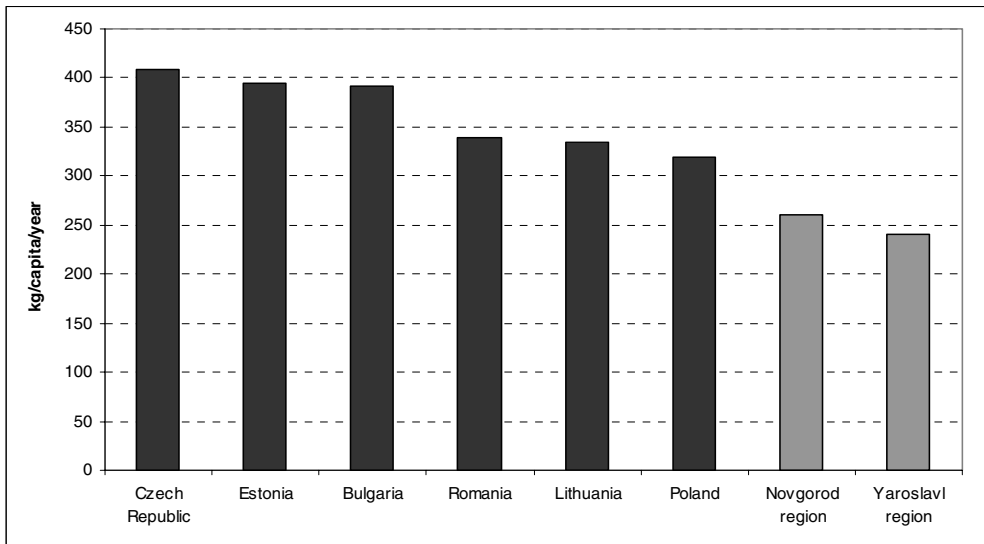
however, be treated with caution, since the lower level of waste generation in rural areas could be the result of unregistered waste dumping due to low coverage by centralised waste collection systems.

Figure 5-18 Per capita municipal waste generation in urban and rural areas (2001)



In comparison to the average levels of waste generation in other countries, the above figures seem low. This could, however, be explained by the significant average income level differentiation in the two regions of the Russian Federation and the CEE countries to which they are compared, as well as possible unaccounted for waste streams in Novgorod and Yaroslavl due to illegal waste dumping practices.

*Figure 5-19 Waste generation in Novgorod and Yaroslavl regions in comparison with selected CEE country averages*



Source: Data collected within waste management project in CEE countries conducted by DHV CR for the Secretariat of Sofia Initiatives on Economic Instruments (SIEI) at the Regional Environmental Centre for Central and Eastern Europe (REC), data collected for Novgorod and Yaroslavl EFS

Landfill disposal is the primary method of municipal waste handling. Typically, multiple landfills and dump sites serving individual cities and towns or groups of them exist, most of which do not comply with national, not to mention international, environmental standards. While most likely not entirely representative of all parts the Russian Federation, the cases of Novgorod and Yaroslavl have, nevertheless, helped to identify the most common problems and issues of waste disposal sites that any investment modernisation programme will have to take into account. Among others, these problems and issues include:

- Lack of synthetic liners at all dump sites and lack of even natural clay lining at most sites.
- No leachate control, collection or treatment.
- Frequent disposal of MSW together with industrial, medical and other types of waste.
- Lack of systematic practice of waste coverage by soil.
- Absence of methane collection system.



- Over-utilisation of many landfills and dump sites beyond their capacity.
- Poor site access control resulting in illegal and uncontrolled waste disposal activities.

Recycling is on the rise, but still at very early stages of development. Several companies in both Yaroslavl and Novgorod oblasts collect recyclables, but their activities are primarily directed towards industrial and commercial waste generators with very little or almost no household involvement. The situation is mainly explained by the lack of demand for recyclables with a resulting lower secondary market price than in other comparable countries (see Table 5-2).

*Table 5-2 Secondary market price of selected recyclables (EUR/tonne)*

	<b>Novgorod</b>	<b>Belgrade</b>
Paper, cardboard	32 - 52	67 - 75
Plastic	97	330
Scrap aluminium	800	790

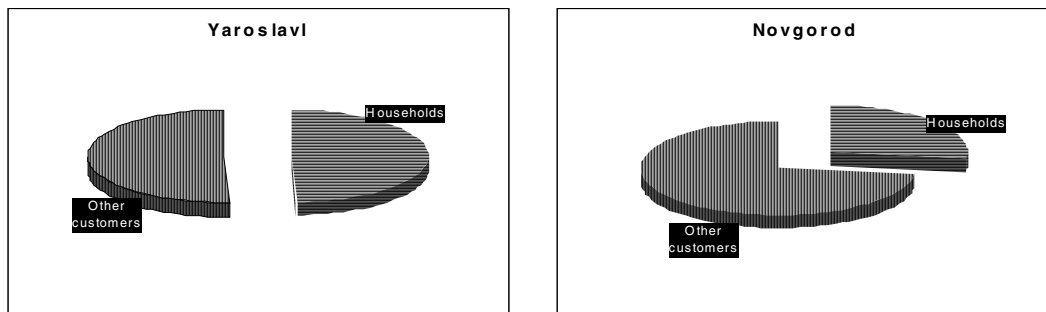
Source: Belgrade waste management company, data collected for Novgorod EFS

### **Financing Sources for MSW Operations and Investment**

The fact that only two studies have been carried out so far within the Russian Federation does not allow conclusions about general trends in financing sources for MSW services. For example, estimates of public expenditure on the solid waste sector differ significantly between the two regions. In Novgorod, it has been estimated to be in the range of RUR 80 million in 2000, or RUR 112 in per capita terms (for the entire oblast population). In Yaroslavl, however, the total public expenses stand at RUR 25 million/year or RUR 20 per person in 2000.

Different proportions of the total user charges paid by households are also observed. As Figure 5-20 demonstrates, the presence of significant cross-subsidisation is apparent in Novgorod oblast, where households account for only 27% of the total revenues of MSW utilities from customers.

Figure 5-20 Share of total user charges paid by households (2001)



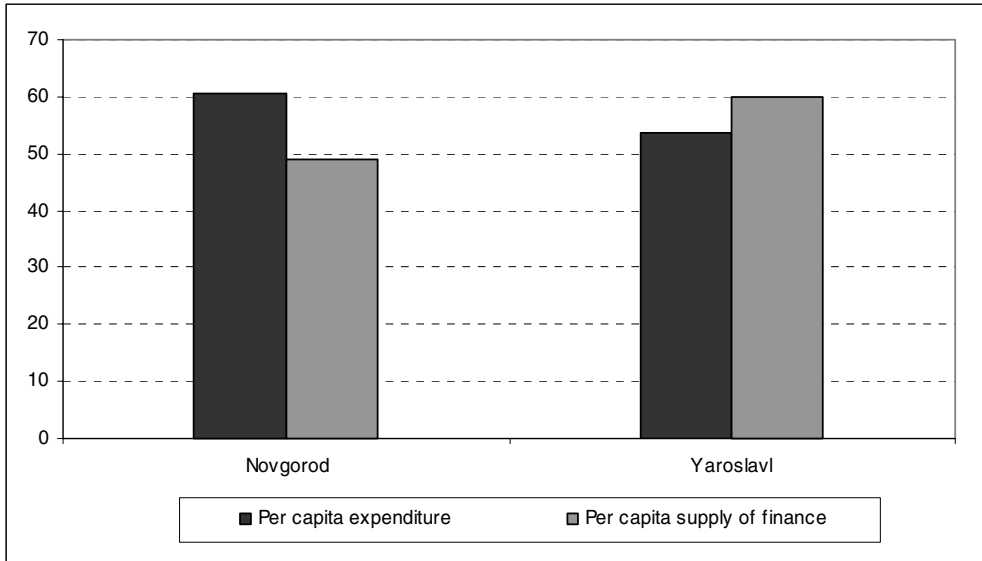
This is also demonstrated by the low levels of the household tariffs. By the end of 2001, it was estimated that the average household expenditure on solid waste services accounted for only 0.5% of the average household income. At the same time, in Yaroslavl, this figure was even less and is standing at 0.3% of the income, on average.

### **Preliminary Results of Novgorod and Yaroslavl Oblast Solid Waste Management Sector Analysis**

The analysis of the existing situation and estimation of the available financing to the sector allowed preliminary conclusions about feasible options for sector service quality and quantity improvements. However, the degree of potential restructuring and improvement measures depend significantly on the regional specificities and capacity to sustain changes financially. Obviously, larger cities are in a better position in this respect than small towns and especially rural areas. As a result, in each study, the region has been broken down into sub-regions according to the current levels of MSW services, future ambitions with regard to reforms, demographic characteristics and the potential for inter-rayon cooperation. For each group, the baseline scenario has been simulated to assess the financing gap of maintaining the existing solid waste management system.

Figure 5-21 demonstrates the results of baseline scenario simulations for group 1 in each region which includes the oblast centre and surrounding rayons. Overall, even if the financing gap is present in Novgorod, it is relatively small, considering the fact that no substantial growth in tariffs has been assumed. In Yaroslavl, there is no financing gap at all, and the sector, as a whole, generates a profit which could be used for the development of more ambitious scenarios.

Figure 5-21 Per capita expenditure need and supply of finance for the baseline scenario



For the less urbanised and rural areas (groups 2 and 3), the baseline scenario projections were similarly optimistic and ran a small surplus over the total expenditure needs.

Furthermore, the more ambitious scenarios of development have been analysed for each group with respect to

- Increases in collection coverage.
- Introduction of recycling collection systems.
- Upgrades of the present disposal practices.

For each of the options, changes in the policy instruments have been assumed, such as a tariff increase, a larger share of public expenditure to the sector, and availability of national and international grants and loan financing.

The overall conclusions may be summarised as follows:

- There is considerable potential for increasing the collection coverage in the oblast, and this is shown to be financially feasible in all the groups of both Novgorod and Yaroslavl oblasts.
- Separate collection of recyclables through the establishment of recycling centres and bring banks would be expedient in major cities where one can expect a sufficient volume of sorted recyclables to warrant the required investments. In these regions, tariff increases within affordable limits would mostly compensate for the additional expenditure needed to introduce new collection practices.
- The target of closing existing dumps and constructing controlled landfills seems to be a financially feasible strategic target for large cities and areas with a high proportion of urban population. In the case of the economically depressed rayons, however, substantial co-financing from the oblast budget would be required to achieve the target.
- Construction of controlled landfills requires a relatively large investment, and the O&M costs are higher compared to the open dump sites.
- Inter-municipal co-operation is therefore necessary in order to ensure a cost-effective system. Fortunately, the discussions in the working group revealed that there is both good motives and potential for inter-municipal co-operation in the Novgorod Oblast.
- Construction of a waste incineration plant in either of the oblasts is not financially expedient.

### **Conclusion**

The case studies in Novgorod and Yaroslavl Oblast have shown that FEASIBLE is a valuable tool in the preparation of environmental financing strategies, which in turn play an important role in charting the course for upgrades and developments of municipal solid waste management systems in regions such as Novgorod and Yaroslavl in Russia.

The main conclusions of the model runs could, at first glance, seem to contradict the common view that waste management companies in Russia are, generally, loss making. This, however, might be due to the fact that most of those companies provide a range of services, including street cleaning and other activities,

which they could be cross-subsidising from the waste management and, thus, overall running a negative balance. Using the model capabilities and scenario analysis, however, it was possible to show that, taken on its own, solid waste management could be a positive cash flow activity, and, if managed and targeted properly, might turn into a profitable business opportunity for municipal service providers.

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## Introductory Statement

**by Mr. Hans Christian Schmidt,  
Minister of the Environment, Denmark**

During the 1990's National Environmental Action Plans (NEAPs) and strategies were developed in most Eastern European countries to address the challenges of reforming the environmental sector along with the transition from planned to market economies. While providing good overviews of the environmental problems and needs in the region, the first generation NEAPs did not reflect the limitations of scarce resources and the need for structural reforms of the environmental sectors. As a response to the limitations of the NEAPs, Denmark and other donor countries have during the last four years supported work in the OECD to develop Environmental Financing Strategies (EFSs), to help countries plan better for environmental improvements and secure long term sustainability of the planned infrastructure investments. The environmental financing strategy is a methodology used to organise information and to balance environmental policies and targets with available resources.

It is well documented today that the municipal infrastructure sector, not least in the water sector, is in a very critical state. This is especially true in countries of the former Soviet Union, the EECCA countries (Eastern Europe Caucasus and Central Asia), where accession to and support from the EU have so far not been driving forces. The current status of public infrastructure in the EECCA region is one of severe under-investment, huge losses of water and energy and a high accident rate. Preventive maintenance has given way to accident management and damage repair, costing several times more than that of regular maintenance. The needs by far exceed the available financial resources, and therefore, governments and service providers must prioritise and seek ways of increasing the financial flow to the sector as well as reducing the costs of providing the services.

The environmental financing strategy is, thus, a methodology to organise information and to balance environmental policies and targets with available resources. Up to now, Denmark has financed the development of a computerised decision support tool, the so-called FEASIBLE model, which facilitates the balancing of needs with available financing. The tool has been tested on a number of country and regional studies in the water sector (Georgia, Moldova, Kazakhstan, Ukraine and three regions in Russia, viz. Novgorod, Pskov and Kalinin-grad), and lately it has been extended to include the waste sector. The waste model has been tested in Novgorod and in Latvia. The first reports (Georgia,



Moldova and Novgorod) were submitted to the Almaty Conference in the year 2000. In response to the “Guiding Principles for Reform of the Urban Water Supply and Sanitation Sector in the NIS” adopted by Ministers in Almaty, additional studies have now been completed, and the FEASIBLE model has been reprogrammed in a more user-friendly second version. This model is available for free to subscribers.

I am pleased to learn that recently other donors, such as the EU TACIS and Germany, have used the methodology and model developed to support EFSs in other regions in Russia and in Armenia. Furthermore, the methodology has been applied without the use of the FEASIBLE model but as a project based prioritisation tool that is particularly relevant in smaller countries and as a next step when overall policies and targets are set.

This report presents an overview of the EFS methodology and, in particular, the FEASIBLE model, and it provides a synthesis of the results achieved so far by applying the methodology. I will not give a summary of the report here but just point to a few key conclusions:

- The studies show that in the EECCA region the financial resources available today are hardly sufficient to cover operating costs of the existing deteriorating water infrastructure.
- User charges have reached affordability levels in some countries like Kazakhstan and Moldova. There is, however, still room for increasing tariffs in other regions, such as Russia and the Ukraine.
- There is scope for reducing operating costs through energy and water saving measures that should also be taken into account when dimensioning and designing new infrastructure or upgrading existing facilities.
- There is no doubt that public budgets as well as international financial support and partnerships will still have to play a substantial role in the future financing of strongly needed capital investments in improved environmental infrastructure. And this support must be linked with continued institutional and economic reforms.

The FEASIBLE model has proven its applicability, not only in EECCA countries but also in accession countries, and I believe that the cost-effectiveness of

Danish environmental investments could also be improved by applying the methodology more actively in Denmark. Lately, the OECD has demonstrated the applicability of the FEASIBLE model in developing countries by developing a financing strategy for the wastewater sector in the Chinese province of Sichuan.

We see the EFS methodology and the FEASIBLE model as important building blocks for the Strategic Partnership on Water for Sustainable Development, which was launched at the World Summit on Sustainable Development in Johannesburg in September 2002. It is my hope that this publication and the EFS methodology including the FEASIBLE model will be of interest to many new user groups (municipal investment planners, regional and national administrations, international financing institutions, consultants, etc.). I wish to thank those institutions, regions and countries, which have actively participated in developing the EFS methodology and the FEASIBLE tool and made valuable information available for the environmental financing strategies in general and for this publication in particular.

## Acknowledgements

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Most of the financial resources for this work has been provided by the Danish government. Other countries/institutions that have provided support for studies include: Australia, EC/TACIS, Germany, UK, Japan

## List of Abbreviations and Acronyms

C&D	Construction and demolition
CIS	Commonwealth of Independent States (of the former Soviet Union)
DANCEE	Danish Cooperation for Environment in Eastern Europe
DEPA	Danish Environmental Protection Agency
EAP	Environmental Action Programme
EECCA	Eastern Europe, Caucasus and Central Asia, comprises countries of the former Soviet Union except the EU accession countries (Estonia, Latvia and Lithuania)
EFS	Environmental financing strategy
EU	European Union
EUR	Euro
FDI	Foreign Direct Investments
FEASIBLE	<u>F</u> inancing for <u>E</u> nvironmental, <u>A</u> ffordable and <u>S</u> trategic <u>I</u> nvestments that <u>B</u> ring on <u>L</u> arge-scale <u>E</u> xpenditure
GDP	Gross domestic product
GEL	Georgian lari
HH	Household
HHW	Hazardous household waste
IFI	International financing institution

ISPA	Instruments for Structural Policy Adjustment
LCD	Litre per capita per day
MRF	Materials recycling facility
MSW	Municipal solid waste
NEAP	National environmental action programme
NIS	Newly Independent States (of the former Soviet Union)
O&M	Operation and maintenance
OECD	Organisation for Economic Co-operation and Development
SMART	Specific, measurable, agreed, realistic and time-bound (targets)
USD	United States dollar
WEEE	Waste electrical and electronic equipment
WS	Water supply
WW	Wastewater
WWT	Wastewater treatment

## Executive Summary

An important obstacle to achieving environmental goals in many countries has been the failure to adequately address the associated financial issues: the costs of achieving environmental goals; how those costs could be minimised; and the challenge of matching costs with available resources. This volume presents an approach for addressing these issues, particularly for investment-heavy environmental infrastructure, such as urban water supply, wastewater collection and treatment and municipal solid waste. Its main message is that a systematic modelling approach to investment and financial management can improve decision-making and ensure a better use of scarce resources. The main ideas underlying this approach are the importance of realism, affordability and cost-effective use of resources in achieving environmental goals.

A computerised decision support tool – FEASIBLE – was developed by OECD and Denmark to help develop financing strategies, mostly in the countries of Eastern Europe, Caucasus and Central Asia (EECCA), but also in EU accession countries and China. It currently may be applied in the water supply, waste water and solid waste management sectors, and the goal is to extend it to energy-related infrastructure. FEASIBLE is freely available and can be obtained through the web pages of OECD, the Danish Environmental Protection Agency and COWI, the Danish consulting firm that developed the model.

The basic approach underlying FEASIBLE is to take public policy targets in areas like water supply and sanitation, determine the costs and timetables of achieving them, and to compare the schedule of these expenditure needs with available sources of finance. This analysis generally reveals “finance gaps” during planned implementation. FEASIBLE can then develop various scenarios to determine how these gaps could be closed. This could be by: identifying policy reforms that could help achieve the targets at lower cost; identifying ways of mobilising additional finance; adjusting the ambition level of the targets; or extending the time period for achieving the targets.

An important feature of FEASIBLE is the emphasis on realism and affordability. The model can assess the levels of finance (public, private, domestic, foreign) that might be available under different macro-economic conditions. In this way it provides a check on what public budgets might realistically be expected to contribute. It can also help to assess the potential social implications of increasing tariffs by determining the impacts of such price increases on household income. By focussing on these issues, the application of FEASIBLE is more than a tech-

nical exercise: it also supports a process of dialogue and consensus building among the key stakeholders involved in financing environmentally-related infrastructure. In this way it can build a bridge between policy development and implementation.

The analyses prepared to date for EECCA countries have shown that the percentage of the urban population with access to water supply, wastewater treatment and solid waste management services is higher than in countries at a similar income level, but that these services are inefficiently designed and very costly to operate and maintain. At the same time, the existing arrangements for providing these services are financially unsustainable. Thus, in most EECCA countries there is a chronic shortage of funds for proper operation and maintenance of infrastructure, such as small repairs, replacement of worn-out parts, small capital repairs and essential rehabilitation. This has resulted in the rapid loss of the economic and technical value of assets. If corrective action is not taken, it may eventually lead to the physical collapse of the infrastructure, with severe consequences for human health, the environment and economic activity.

The grave situation in EECCA calls for a fundamental reform in the approach to financing environmentally-related infrastructure and the associated policy and institutional arrangements. Overly ambitious plans to extend the coverage and level of infrastructure services need to be replaced by more realistic, modest capital improvement programmes, tailored at providing essential repairs and rehabilitation of critical elements of infrastructure in order to maximise efficiency gains (mainly reduction of energy costs) within the limits of what households and public budgets can afford.

Even achieving these more modest objectives represents a major challenge for EECCA countries. *User charges* will be the most important long-term source of finance for operation and maintenance expenditure, though the low income in many EECCA countries represents an important affordability constraint. *Public budgets* will have an essential role in the short and medium term in financing rehabilitation and capital investments, in providing social protection and in facilitating access to credit. However, infrastructure programmes have to compete with other pressing social priorities. Thus, scarce *public funds and donor grants* need to be strategically prioritised; they will need to be increased in many

EECCA if the Millennium Development Goals are to be achieved<sup>1</sup>. The importance of *domestic financial and capital markets* will grow over time. *International financial institutions (IFI)* will continue to have an important role in capital investments and promoting financial and management discipline. The role of the *private sector* will for many years be more important in providing managerial know-how than finance.

Even though the development of environmental financing strategies (EFS) has only been undertaken in the last few years, it has already triggered some significant policy changes in EECCA countries. *In Novgorod Oblast (Russia)*, the EFS for the water sector was officially adopted by Regional Government and used to identify a portfolio of projects co-financed by the Oblast and international donors. The municipal waste EFS for *the Novgorod and Yaroslavl Oblasts* led to a revision of the waste management plans that involved the identification of more cost-effective regional solutions. *In Moldova*, the EFS was adopted as an official policy document and supported a draft government resolution relaxing unrealistically stringent wastewater effluent standards. *In Kaliningrad (Russia)*, the EFS was used to identify a portfolio of projects co-financed by the Oblast and international donors. *In Ukraine*, the EFS was used to support a comprehensive water sector strategy. *In Pskov (Russia)*, the EFS stimulated a policy debate about infrastructure development targets that were revealed as being financially unsustainable and unrealistic. *In Georgia and Kazakhstan*, the EFS has provided a revealing “reality check” on possible co-financing arrangements with IFIs and donors.

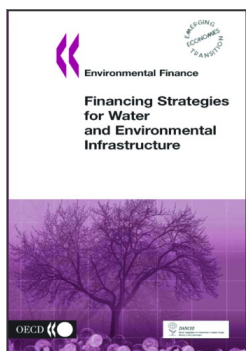
The experience accumulated to date suggests that the environmental financing strategy methodology can be useful tool for governments in developing realistic plans to achieve nationally or internationally agreed targets. The underlying assumption is that governments should not finance all or most expenditure, or sponsor all or most projects. Relying on the public budget to finance operational and maintenance costs of collective infrastructure, for example, is not a sustainable solution. The main role of government in relation to finance is to establish the policy, regulatory and institutional framework within which resources from users, financial markets, capital markets, local budgets and enterprises can be

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<sup>1</sup> As one of the Millennium Development Goals, by 2015 all United Nations Member States have pledged to reduce by half the proportion of people without sustainable access to safe drinking water. At the Johannesburg Earth Summit it was further agreed, by 2015 to reduce by half the proportion of people without access to basic sanitation



mobilised in a complementary way, and applied as cost-effectively as possible to achieve agreed goals. Hence, the financing strategies can be useful not only to help plan the government budget, but also in suggesting how policy instruments that affect the capacities and decisions of other public and private financial agents might be reformed.



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