R E P O R T

ON WATER PRICING/COST RECOVERY

IN THE BALTIC SEA COUNTRIES

prepared for HELCOM Secretariat

by Marek Roman

October 2002

TABLE OF CONTENTS

SUMMARY

This report concerns the state of water pricing and cost recovery in the sector of communal water supply and sewerage in the 8 Baltic Sea countries: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden. No information have been available from Russia. Because of the range of information delivered by the individual countries the report is limited to the problems of water pricing and cost recovery in the household sector and does not embrace the industrial and agricultural sectors.

The considered 8 Baltic Sea countries differ in the amount of annual renewable water resources per capita – from 1580 m^3 (Poland) to 21 153 m^3 (Finland). Ground water resources are the main sources for public water supply in the majority of these countries. The percentage of population served by the public water supply ranges from 66% (Lithuania) to 98% (Germany). The percentage of population served by the public sewerage system is lower than the values given above and it ranges from 56% (Poland) to 95% (Denmark and Germany).

The legislation basis for the water tariff policy in considered countries are legal acts issued on the national level. In principle, there are two types of legal acts: relating to the environmental charges and relating to the water supply and sewerage services. It is also a principle that the legislation concerning the environmental charges provides specific rules, while the legislation concerning charges for water services provide only a framework giving a liberty in establishing tariffs by local authorities (that does not relate entirely to the legislation in Denmark, Finland and Sweden where water abstraction and pollution charges are not applied to the household sector). It is significant, that the legal rules issued lately in Estonia, Latvia, Lithuania and Poland refer to the Water Framework Directive of EU (2000/60/EC).

At present, general principles for the establishing of water tariffs in considered countries are different. However, they will be liken in the nearest future due to the introduction the new legislation based on the Water Framework Directive in Estonia, Latvia, Lithuania and Poland. Now in all countries the operation and depretiation costs are included in charges, but investments costs are fully included in Finland and

Sweden only. In Denmark and Germany they are included to a high degree, in Lithuania – partially, and in Estonia, Latvia and Poland they are not included at all. The environmental charges (for water abstraction and wastewater discharges) are applied as a part of charges for water services in Estonia, Germany, Latvia, Lithuania and Poland, and not applied in Denmark, Finland and Sweden. All countries, except Lithuania with regard to water supply services, and except Germany and Lithuania with regard to sewerage services, introduced the VAT. The percentage values of this tax is differentiated and ranges from 7% to 25%. It is not allowed to make a profit on providing water and sewerage services in Sweden, and on providing sewerage services in Germany. In Estonia, Latvia, Lithuania and Poland the legislation provides formal basis for inclusion the profit to the charges, but nowadays charges in these countries do not even cover the total cost of services.

The full recovery of direct costs related to the water services is achieved only in Finland and Sweden, however the full cost recovery in the meaning of the 2000/60/EC Directive is not achieved due to taking no account of the environmental costs in the tariff. In Denmark and Germany the degree of cost recovery is high, in Estonia, Latvia, Lithuania and Poland is achieved in a small degree. The new legislation in the latter once provides basis for full recovery of services cost, but this is a case for the future.

In considered 8 Baltic Sea countries three types of tariffs are used:

- a fixed charge tariff (a flat fee) – Estonia, Latvia, Lithuania and Poland,
- a direct proportional volumetric tariff (unipart) – Denmark (in relation to the sewerage services only), Estonia, Latvia, Lithuania and Poland,
- a two-part tariff (fixed charge plus volumetric charge) – in Denmark, Estonia, Lithuania (theoretical possibility), Poland and Sweden.

In some countries (Denmark, Finland, Germany, Sweden and Poland) tariffs for storm-water disposal by means of the sewerage system are also applied.

The comparison of prices for water supply and sewerage services within the group of 8 Baltic Sea countries shows that the prices in Estonia, Latvia, Lithuania and Poland (0.10-0.96 EURO/m^3 in relation to water supply services and 0.23-2.1 EURO/m^3 in relation to sewerage services) are several times lower then in Denmark,

Finland, Germany and Sweden (0.8-2.5 EURO/m^3 in relation to water supply services and 1.2-3.2 EURO/m^3 in relation to sewerage services).

The share of expenditures for water supply and sewerage services in household income ranges from 1.4% to .5% in Estonia, Latvia, Lithuania and Poland, while in Germany amounts to 1.0%. In spite of the fact, that the prices for water supply and sewerage services in absolute values are significantly lower in these four countries then in Germany, a hypothesis could be drawn out, that at present charges for water services are more burdensome for the inhabitants of these 4 countries that for Germany population.

The situation presented in this report allows to state that considered 8 Baltic Sea countries are still far away from reaching the postulated goal of full cost recovery of water services (taking into consideration direct services cost, environmental costs, and resources costs). Denmark, Finland, Germany and Sweden are closer to reach this goal but Estonia, Latvia, Lithuania are more faraway. All these countries should elaborate their strategies to reach the state of adequate cost recovery of water services.

The realization of idea of cost recovery of water services will result in rise of prices of these services, and, unfortunately, will encumbrance the household budgets. Because of that the activities in this direction have to be well balanced and implemented gradually, so not to exceed the barrier of population's ability to pay. It is especially important in Estonia, Latvia, Lithuania and Poland where the average income of the households and GDP per capita is very low. Additionally, these four countries will have to increase significantly the accessibility to water supply and sewerage services by the population (especially in rural areas) what will create very high financial needs.

Information collected from the investigated Baltic Sea countries are not sufficient to determine substantial quantized effects of the influence of the tariff systems on the environment. However, general notes can be presented. Inclusion of environmental charges to the charges for water supply and sewerage allows for collection financial means for improvement of water resources management and protection of water resources quality. The rise of prices for water services significantly influences the rationalization of water consumption. It results in decrease of the use of

water resources and reduction of the wastewater discharges. These positive effects are accompanied by some negative effects resulting from decrease in water consumption as unfavorable changes in the water quality collected in distribution system and some difficulties in wastewater treatment.

1. INTRODUCTION

This report concerns the state of the water pricing/cost recovery in the water sector in the Baltic Sea countries. The definition of "water" used here embraces water as well as wastewater, so the report deals with issues related to the water pricing and cost recovery in the sector of municipal water supply and sewerage.

As a base for the elaboration of this report 16 documents received from the HELCOM Secretariat have been used. These documents contain information supplied by the Baltic Sea countries by the end of 2001, information from the European Investment Bank, the publication "Water pricing in the EU. A Review" by Eva Roth (EEB) as well as some UN and EU documents.

The 16 documents contain information on the 6 Baltic Sea countries: Estonia, Germany, Latvia, Lithuania, Poland and Sweden. There are any information from the remaining three riparian countries: Denmark, Finland and Russia. The documents contain information which differentiates with regard to the content and details. Some of them are very detailed and extensive (for example from Germany), and some are very short and vague (for example from Latvia). Numerical data forwarded in particular materials refer to different years. It created a lot of difficulties in the elaboration of this report, both in its part concerning a synthetic presentation of information about the individual countries and in the part concerning comparison between them. To make the report more complete it was decided to supplement the given data with information from other sources. First of all two elaborations have been used: "The price of water. Trends in OECD Countries (OECD. Paris 1999)" and "Water Pricing in selected Accession Countries to the European Union – current policies and trends (a report produced for the European Commission – DG Environment, 2000)". Also other sources have been used and a request for supplementary information has been sent to competent people in the particular countries. Possibilities to collect additional information have been limited because of the short time, which was set for the elaboration of this report. Thanks to the use of information from other sources it was possible to unify and widen the information and

to gain information on Denmark and Finland. The report embraces 8 Baltic Sea countries: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden.

Due to the range of information provided by the individual countries the report is limited to the problems of water pricing and cost recovery in the household sector and to the limited degree in the industrial sector. It does not embrace the agricultural sector.

The main part of the report contains overview of principles and instruments, presentation of positive and negative cases and some considerations related to the effects on the water environment as a result of used measures. Synthetic presentation of data concerning payments for water supply and sewerage services in particular Baltic Sea countries as well as summary of information on water tariff policy in the EU and on the approach of IFIs to the water tariff policy are given in Annex I to the report.

The list of basic materials (documents received from the HELCOM Secretariat, additional materials used in this report, and documents containing remarks to the Draft Report) are attached in Annex II to the report.

The character of this report is a “desk study”, mainly based on information provided by the Contracting Parties.

2. GENERAL DATA ON WATER RESOURCES AND POPULATION SERVED BY THE WATER SUPPLY AND SEWERAGE SERVICES IN BALTIC SEA COUNTRIES

The considered 8 Baltic Sea countries differ in the number of population, the amount of renewable water resources per capita, the amount of consumed water and the scope of water supply and sewerage services for the inhabitants. As it arises from the data given in a Table 1, relatively big amount of annual water resources per capita is in Finland, Sweden, Estonia and Latvia; in Poland and Denmark the amount of annual water resources per capita is small.

Table 1. Water resources and water abstraction for households water supply in Baltic countries [1)]

Country	Renewable water resources m^3 per capita per year			Water abstraction for households water supply		
					Specification:	
	Internal	Rivers flow from other countries	Total	Million m^3 per year	under-ground water %	surface water %
Denmark	2264	-	2264	417 (2000)	100[2)]	
Estonia	8050	3240	11290	63 (1998)[3)]	65	35
Finland	20576	577	21153	404 (1999)	58	42
Germany	1305	866	2171	5810 (1995)	70	30
Latvia	567	11373	11940	120 (1998)[3)]	47	53
Lithuania	4140	2903	7043	133 (2000)	100[2)]	
Poland	1440	140	1580	2350 (2000)	63	37
Sweden	19213	786	19999	936 (1995)	37	63

Sources: "OECD. Environmental data. Compendium 1999". OECD, Paris 1999.
"Water for 21st Century. Vision to Action. Central and Eastern Europe". 2000. (ISBN 91-630-9207-7).
"Water pricing in selected Accession Countries to the European Union, current policies and trends (European Commission – DG Environment. 2000)".
Information delivered by Baltic Countries.

1) Data from Russia are not included.
2) Approximately.
3) Roughly estimated.

To supply the population with water, the ground water resources are utilized first in the majority of these countries. In Denmark and Lithuania water supplied for the inhabitants is derived nearly in 100% from these resources, in Estonia, Finland, Germany and Poland this value ranges from 58% to 70%. Surface water resources prevail in water supply for the population in Latvia and Sweden.

Table 2. Population and range of water services in Baltic countries [1)]

Country	Population		
	Country wide Million	% served by water services[2)]	
		water supply	sewerage
Denmark	5.3 (2000)	95 (1997)	95 (1997)
Estonia	1.4 (2000)	77 (1999)	77 (1999)
Finland	5.2 (2000)	90 (2001)	80 (2001)
Germany	82.0 (2000)	98 (1997)	92 (1997)
Latvia	2.4 (1999)	77 (1998)	60 (1998)
Lithuania	3.5 (2001)	66 (2000)	58 (2000)
Poland	38.6 (2000)	86 (2000)	56 (2000)
Sweden	8.9 (2000)	87 (1997)	86 (1997)

1) Data from Russia are not included.
2) Percentage figures given indicate population connected to the public water supply and sewerage systems. The most the remaining population is connected to the individual systems.

As it is presented in a Table 2, for considered group of Baltic Sea countries the percentage of population connected to the central, public water supply systems ranges from 66% to 98% - this index is the highest in Germany (98%) and Denmark (95%) and the lowest in Latvia (77%) and Lithuania (66%). The percentage of the population connected to the sewerage system is lower than the values given for the water supply system and it ranges from 56% to 95% - this index is the highest in Denmark (95%) and Germany (95%) and the lowest in Poland (56%) and Lithuania (58%). The percentage of population using the public water supply and sewerage systems in towns is much higher than in rural areas in all of these countries. The part of the population, which is not connected to the public water supply and sewerage systems, uses the individual systems, which in cases of bad technical conditions can create a danger to the public health and environment. Data presented in a Table 2 shows, that the

accessibility to water supply and sewerage services by the population have to be increased significantly, especially in rural areas, in countries such as Estonia, Latvia, Lithuania and Poland. It is a difficult task, especially with regard to the sewerage services, because at this moment these services do not embrace, in appropriate, the treatment of wastewater.

3. OVERVIEW OF PRINCIPLES AND INTSTRUMENTS

3.1. Legislation basis for water tariff policy

Information delivered by the analyzed countries on the legislative base of the tariff policy in the water sector are not complete. However, it can be stated that in each of these 8 countries the legal acts providing basis for activities in the field of water services are issued on the national level. In principle there are two types of the main legal acts:

- relating to environmental charges,
- relating to water supply and sewerage services.

The main acts are mostly accompanied by legislation of inferior rank which determine in details regulations concerning the charges, calculation of environmental charges as well as tariffs for water supply and sewerage services. It is a principle that the legislation concerning the environmental charges determines the specific rules which are obligatory in the whole country, and legislation concerning the charges for water supply and sewerage services provides only a framework and gives a big liberty in establishing charges by local authorities, mainly by the commune authorities.

The above-mentioned conclusions do not relate to the legislation in Finland, Sweden and Denmark, where environmental charges for the water abstraction and wastewater disposal are not applied to the household sector (in Denmark, the water and wastewater tax is introduced instead). It is significant that the legal rules issued lately in Estonia, Latvia, Lithuania and Poland refer to the Water Framework Directive of EU (2000/60/EC) which aims at the realization of the ”polluter pays principle” and the principle of recovery of the costs of water services.

3.2. General principles for establishing water tariffs

Charges for water supply and sewerage services in the household sector generally include the following costs of services: operation costs, amortization (depreciation) costs, investment costs, environmental charges (for water abstraction and wastewater disposal), taxes and profit. Consideration of these factors in charges is regulated by national regulations and it differs in the group of the 8 analyzed Baltic Sea countries.

Table 3. The recovery of the cost of water services in Baltic Sea countries [1)]

Country	Costs included in the prices of services				
	Operation	Depreciation	Investment	Percentage cost recovery	
				water supply	sewerage
Denmark	Yes	Yes	Yes[2)]	~100%	~100%
Estonia	Yes	Yes[3)]	No	30%	30%
Finland	Yes	Yes	Yes	100%	100%
Germany	Yes	Yes	Yes[2)]	97%	75%
Latvia	Yes	Yes	No	<< 100%[4)]	<< 100%[4)]
Lithuania	Yes	Yes[4)]	Partially	<< 100%[4)]	<< 100%[4)]
Poland	Yes	Yes[5)]	No	<< 100%[4)]	<< 100%[4)]
Sweden	Yes	Yes	Yes	100%	100%

1) Data from Russia are not included.
2) Subsides are allowed and realized.
3) The degree of inclusion of depreciation costs in the prices varies in this country: in some cases depreciation is fully covered by prices of services, in some – partially only and in other – not at all (in rural area).
4) Depretation of grant financed assets can be included in to tariff.
5) Very often the value of asset is not real.
6) Not exact figures.

Table 3 shows that the operation and depretation costs are included in the charges in all countries (but the depretation costs are not always wholly considered). The discussed countries differ significantly between each other when we take into consideration the investment costs included in the charges. In Finland and Sweden these costs are included in the charges fully, in Denmark and Germany – to a high degree, but not completely, in Lithuania – partially. In Estonia, Latvia and Poland investments are, as a rule, wholly subsidized so the investments costs are not included in the charges at all or only to a very small degree. As a result, at this moment a full recovery the service costs by charges is achieved only in Denmark, Finland and

Sweden; in Estonia, Latvia, Lithuania and Poland this recovery is on a very low level. In these last 4 countries the new legislation provides basis for a full recovery of service costs by charges. But this is a case for the future.

Inclusion of taxes and environmental charges in the tariffs in the discussed countries is illustrated by data presented in a Table 4. All countries, except Latvia, introduced VAT on water supply services and, except Latvia and Germany, on sewerage services. The percentage value of this tax is differentiated within the group of these countries and it ranges from 7% to 25%.

Table 4. Taxes and levies in household water tariffs in Baltic Sea countries [1)]

Country	Water supply services			Sewerage services		
	VAT %	Abstraction charge	Other taxes	VAT %	Pollution charge	Other taxes
Denmark	25%	No	Yes[2)]	25%	No	Yes[3)]
Estonia	18%	Yes	na	18%	Yes	na
Finland	22%	No	No	22%	No	No
Germany	7%	Yes	Yes[4)]	No	Yes	Yes[4)]
Latvia	No	Yes	na	No	Yes	na
Lithuania	18%	Yes	Yes[5)]	18%	Yes	Yes[5)]
Poland	7%	Yes	Yes[6)]	7%	Yes	Yes[6)]
Sweden	25%	No	No	25%	No	No

1) Data from Russia are not included.
2) Water tax.
3) Wastewater tax.
4) Administration fees connected with the permission for water abstraction/wastewater discharge (respectively).
5) Land rent tax.
6) Land rent tax and tax on immovable property.

na – data not available.

In Denmark, Finland and Sweden charges for water abstraction and disposal of wastes are not introduced till now. In the remaining countries they are applied. Detailed rules for calculating and rates of these charges differ very much within this group of countries. Examples from Lithuania and Germany are presented in Box 1 and Box 2. It should be underlined that in Denmark, Finland and Sweden in spite of a full or a very high return of costs by charges we cannot speak about a total recovery of cost in the meaning of the 2000/60/EC Directive, due to taking no account the environmental costs. In some countries other taxes are included into these charges, but information on them is very scarce.

Collected information on the inclusion in the charges of the profit made by the enterprise providing water and sewerage services are not complete. It is known, that in Sweden law does not allow the enterprise to make a profit on water supply and sewerage services. The German law does not permit to make a profit on sewerage services (but it can be made on water supply services). In Finland the law permits to make a profit on water services and it is included in the charges for services. In Estonia, Latvia, Lithuania and Poland the new legislation provide basis for inclusion the profit to the charges, but at this moment this is only a theoretical possibility, because the charges in these countries do not cover the total cost of services.

Box 1. Environmental charges in Lithuania

Presently, charges for water abstraction in Lithuania are as follows (according to the Governmental Order No. 1320, October 10, 1995):

- For surface water
  - for industrial purposes and agricultural uses – 0.005 LTL/m^3,
  - for cooling of thermal electric power and for fishery needs – 0.0005 LTL/m^3,
  - for hydroenergetics – 0.00002 LTL/m^3,
  - for Ignalina Atomic Power Station – 0.001 LTL/m^3,
- For groundwater
  - for the household use – 0.03 LTL/m^3,
  - for the industrial purposes – 0.07 LTL/m^3.

Charge for water pollution by discharged wastewater in Lithuania (according to the Law on Environmental Pollution Taxes) are presented below:

Pollutant	Charges LTL per one ton of pollutant (2000)
BOD	485[1)]
Total N	435[1)]
Total P	1480[1)]
Suspended solids	86[1)]
Sulphates	2
Chlorides	9
Special group of pollutant:	
I group – Halogenic organic carbons	8 700 460
II group – Metals, their compounds (Ar, Cd, Hg, Va, Cr^{+6}) and organic compounds (phenols, chloroform, formaldehyde)	792 710
III group – Halogenated organic carbons, metals (Pb, Sb, Co, Ni, Cu), organic compounds	129 250
IV group – Metals and their compounds (Zn, Mn, Cr^{+3}), non organic anions, organic compounds (e.g. oil products), detergents	29 290
V group – Non-organic halogenids and anions, metals and their compounds, organic materials	287

1) During the period 2000-2004 gradually increase of the charges is decided.

Box 2. Environmental charges in Germany

Charges for water abstraction for the public water supply in Germany (1997) are presented below:

State (Land)	Rate DM/m^3	State (Land)	Rate DM/m^3
Baden-Württenberg	0.10	Meclenburg – Western Pommerania	0.035
Bavaria	-	North Rhine-Westfalia	-
Berlin	0.60	Rhineland – Palatine	-
Branderburg	0.10	Saarland	-
Bremen	0.10	Saxony	0.03
Hamburg	0.10	Saxony – Anhalt	-
Hesse	0.50	Schleswig-Holstein	0.10
Lower Saxony	0.10	Turingia	0.05

Source: R.A.Kraemer, M.Strübin, W.Hansen: Money Flows: Economics of Water Supply and Sewerage in Germany. 1998.

The charges for wastewater discharge into the receiving water are calculated by multiplying the number of pollution units (SE) of the discharge by unit tariff. The pollution unit contains different amounts of pollutant, according to the following rules: 1 SE = 30 kg organic matter (COD); 1 SE = 3 kg phosphorus; 1 SE = 25 kg inorganic nitrogen; 1 SE = 2 kg halogenated hydrocarbons (AOX); 1 SE = 20 g mercury (and compounds); 1 SE = 100 g cadmium (and compounds); 1 SE = 500 g chromium, nickel or led (and compounds); 1 SE= 1000 g copper (and compounds); 1 SE = 3000 m^3 wastewater divided by dilution factor by which wastewater must be diluted in order to lose its acute toxic effect on fish. The rate was set at DM 70 per SE (1997). The charge is raised with the percentage by which values specified in the license of discharge are exceeded, and reductions are applied when the quality of wastewater is better than required. Municipal authorities extending or constructing wastewater treatment plants are eligible to three years omission from the charge. Storm water run-off from the public sewerage is charged according to the following rule: the number of SE accounted is set as 12% of the population connected.

Source: European Commission. Wastewater charge schemes in the European Union. Brussels. Luxembourg 1995.

3.3. Tariff structures applied

Table 5 demonstrates that three types of tariffs are used in the considered group of 8 countries: a fixed charge (a flat fee), a direct proportional volumetric tariff (for 1m^3) and a mixed tariff – a two-part tariff (fixed charge plus a volumetric charge). In Denmark, Finland, Germany and Sweden only two-part tariffs are used (in Denmark

an uniform volumetric tariff is used for sewerage services, but it is under consideration to introduce a two-part tariff in the future). Fixed charge tariffs are used in countries in which part of water is supplied to households without measurement of its volume (Estonia, Latvia, Lithuania). In Poland there is also a fixed charge, but it is applied only in case when the water meter is out of order and must be replaced. An unipart volumetric tariff is applied in Estonia, Latvia, Lithuania and Poland in cases, when the delivered water is measured by the water meters. In Lithuania and Poland a two-part tariff is also introduced – it can be anticipated, that the scope of use of this type of tariff will be growing during the coming years in these countries. The average share of the fixed charge in the whole charge constitutes in a two-part tariff 9% to 30% in the analyzed group of countries, but in Finland and Sweden are tendencies to increase this share in the coming years.

Table 5. Household tariff structures in Baltic Sea countries [1)]

Country	Metering penetration %[7)]	Fixed charge (Flat fee)	Volumetric rate (per 1 m^3)	A two-part tariff: fixed part + volumetric part (fixed part as % of total in brackets)	
Denmark	~ 100%		Yes[2)]	Yes	(30%)[3)]
Estonia	> 50%	Yes	Yes		
Finland	~ 100%			Yes	(20%)
Germany	~ 100%			Yes	(9%)[4)]
Latvia	~ 60%	Yes	Yes		
Lithuania	~ 85%	Yes	Yes	Yes	(30%)[5)]
Poland[6)]	~ 100%	Yes	Yes	Yes	(na)
Sweden	~ 100%			Yes	(30%)

1) Data from Russia are not included.
2) In relation to sewerage services.
3) In relation to water supply services.
4) In Germany the fixed part as % of total varies in wide range; 9% is an average percentage.
5) A two-part tariff is not be applied at present – it will be applied as a result of introduction the new legislation.
6) In Poland the main type of tariffs is volumetric rate at present, but it will be changed to a two-part tariff because of a new legislation; flat fee is applied very rarely - mostly in the case of repairing or exchanging of the water meter.
7) According to "Water pricing in selected Accession Countries in European Union, current policies and trends (European Commission – DG Environment 2000)."

na – data not available.

In some countries (Denmark, Finland, Germany and Sweden) tariffs for disposal of rainwater by means of the sewerage system are also used. This type of charges is also being introduced in Poland.

3.4. Tariff systems as instruments for financing public water supply, sewerage system and environmental protection

Data collected from the 8 analyzed Baltic Sea countries allow only for the general observations concerning the role of tariffs as instruments for financing public water supply, sewerage system and environmental protection.

Charges for water supply and sewerage services are an instrument for financing modernization and the development of water supply and sewerage systems in countries, where tariffs consider investment costs to a high degree (Denmark, Finland, Germany and Sweden). In other countries (Estonia, Latvia, Poland) service charges do not create such possibilities because they cover only operation and maintenance costs (including depretiation). Nevertheless, where charges fully consider depretiation cost, there is a chance to create some financial means for small modernization and development works.

Charges for water supply and sewerage services in Estonia, Germany, Latvia, Lithuania and Poland include environmental charge, and thanks to that, may serve as instruments to finance undertakings aiming at rationalization of the management of water resources in the scale of river basins and supervision as well as protection of the quality of water resources. In Denmark, Finland and Sweden tariff for water supply and sewerage services cannot be used as such instrument, because in these countries environmental fees are not applied in respect to households.

Considering the role of tariff systems as an instrument for financing the development of the public water supply and sewerage networks or systems for environmental protection, we have to take into account, that this role will be limited during the coming years in such countries like Estonia, Latvia, Lithuania and Poland. The tariff level for water supply and sewerage services must be adapted to the affordability levels and these are, at this moment, very low in these countries. Crossing

the barrier of affordability level may result in a break in the payment collection and by this, annihilate the role of tariffs as an instrument for investment financing.

3.5. Comparison of prices for water supply and waste water services and their share in expenditures of household budgets and in specific GDP

Comparison of prices for water supply and sewerage services within the group of 8 Baltic Sea countries (Table 6) shows, that prices for services counted in EURO/m^3 are several times lower in Estonia, Latvia, Lithuania and Poland than in Denmark, Finland, Germany and Sweden. This is not only a result of the significantly lower level of coverage of the service costs by charges in the first group of countries than in the second group, but also of the lower global price level in the first group comparing to the second group. The GDP (Gross Domestic Product) per capita is also several times lower in these countries.

Table 6. Comparison of the GDP per capita and the prices of water supply and sewerage services in Baltic Sea countries [1)]

Country	GDP[2)] USD per capita	Prices EURO/m^3	
		Water supply	Sewerage
Denmark	30416 (2000)	1.85 (2001)	2.5 (2001)
Estonia	3 291 (1997)	0.25-0.52 (2000)	0.2-0.96 (2000)
Finland	23534 (2000)	0.8-1.3 (2001)	1.2-1.6(2001)
Germany	22622 (2000)	0.8-2.5 (1998)	1.2-3.2 (1997)
Latvia	2 239 (1997)	0.10-0.96 (1998)	1.1-2.1 (1998)
Lithuania	3 458 (2001)	0.23-0.76 (2000)	0.23-1.2 (2000)
Poland	4 078 (2000)	0.27-0.92 (2001)	0.27-0.97 (2001)
Sweden	25 017 (2000)	1.15 (1997)	1.7 (1997)

1) Data from Russia are not included.
2) According to the official exchange rate. Source: International Statistical Yearbook 2000. Central Statistical Office Warsaw 2001 and Statistical Yearbook of the Republic of Poland. Central Statistical Office. Warsaw 2002.

Data concerning the share of expenditures for water supply and sewerage services in the household budget or in the GDP are not complete (Table 7). Data from Denmark, Finland and Sweden have not been submitted. It can be noticed that these shares are higher in Estonia, Latvia, Lithuania and Poland than in Germany. In spite of the fact, that the prices for water supply and sewerage services in absolute values are in these four countries significantly lower then in Germany, a hypothesis could be draw out that, as for today, charges for water services are more burdensome for the inhabitants of these 4 countries than for the German population. Possibilities to give this matter a throughout consideration are limited, because there are not adequate researches on the acceptable level of burden for the household budget by charges for water supply and sewerage services.

Table 7. Share of expenditures for water and wastewater services in household budget and in specific GDP [1)]

Country	Share of expenditures for water and wastewater services %	
	in household budget[4)]	in specific GDP[2)]
Denmark	0.8 % (1999)	na
Estonia[3)]	2.5 % (1998)	5.2 % (1998)
Finland	na	na
Germany	1.0 % (1996)	0.85 % (1996)
Latvia[3)]	1.5 % (1998)	0.9 % (1998)
Lithuania[3)]	1.5 % (1998)	1.1 % (1998)
Poland[3)]	1.4 % (1998)	6.2 % (1998)
Sweden	na	na

1) Data from Russia are no to included.
2) GDP per capita per year and expenditures for water and wastewater services per capita per year.
3) Source: Water pricing in selected Accession Countries to the European Union, current policies and trends. European Commission – DG Environment. 2000.
4) In households income.

na – data not available.

4. EXPERIENCES – POSITIVE AND NEGATIVE CASES

4.1. Positive case – Germany

Every one of the investigated countries solves some problems of water pricing and cost recovery in a way, which can be evaluated as positive. However, taking into consideration the complex of solutions in the whole country, Germany has to be mentioned as a positive case.

The tariff system with regard to the water supply services in Germany takes into account the following elements:

- operation and maintenance costs,
- capital costs,
- water resources taxes,
- profit

The tariff system with regard to the sewerage services takes into account analogical elements, but without profit:

- operation and maintenance costs,
- capital costs,
- effluent charges.

Water and wastewater prices are meant to:

- cover the cost of water supply/sewerage,
- reflect the specific costs caused by different classes of water users/wastewater "producers",
- reflect the cost structure of water supply/sewerage in a two part tariff,
- provide an appropriate return of capital,
- reflect the need to maintain the physical capital.

Realization of the above mentioned rules is not fully achieved, but all in all the tariff system implemented in Germany allows to:

- achieve a high level of cost recovery through charges of water supply services (in 97% - regarding water supply services and in 75% - regarding sewerage services),

- ensure possibilities of development and modernization of technological systems for water boards and render the high quality services,
- charge, in a fair way, the different types of recipients of services and to limit the cross-subsidy,
- accumulate funds for water resources economics and for quality protection of water resources (among other things it gives the possibility of compensation payments to farmers in cases, when their economical activity has to be limited because of conflict with water supply or water resources contamination),
- result in reduction of the water consumption, loss and waste of water and thereby ensure a better use of water recourses.

Characteristic feature of the tariff system in Germany is a wide freedom given to the commune authorities in the range of setting tariff of charges, under condition that the communes are observing Federal and State regulations.

German tariff system is criticized in various studies, because the rates of charges for water supply and wastewater in relation to 1 m^3 are, in comparison with other countries, high. In fact they are higher than in Denmark, Great Britain, Netherlands, France or other European countries. However, taking into account the low unit water consumption (per capita) in Germany and taking into account the yearly fee for 1 inhabitant who uses water supply services, it appears that costs of these services are on the level close to the costs in the other countries mentioned above. The share of the charges for water supply services in the household budget in Germany amounts to 0.85% only, and in GDP per capita – 1.0% (Table 8). These indexes are low and for sure the rates of charges for water supply services do not create any sensible problem among German population and in public opinion.

Table 8. Cost of water supply and sewerage services in relation to household incomes and to GDP in Germany

Specification	Water Supply	Sewerage	Total
Total annual bill per capita	140.00 DM	224.00 DM	364.00 DM
Cost recovery rate	97%	75%	82%
Total annual cost per capita	144.33 DM	298.67 DM	443.90 DM
Household income (HI) per capita			36 400.00 DM
Total bill in % of HI	0.38%	0.62%	1.00%
Total cost in % of HI	0.40%	0.82%	1.22%
GDP per capita			43 024.00 DM
Total bill in % of GDP	0.33%	0.52%	0.85%
Total cost in % of GDP	0.34%	0.69%	1.03%

All data relate to 1996.
Source: R.A.Kraemer, M.Strübin, W.Hansen. Money Flows: Economic of water supply and sewerage in Germany. 1998.

Generally it can be stated that even if the tariff system in Germany does not fulfill, till now, the requirements of the European Community determined in the Directive 2000/60/EC, the present state of this system creates a good starting point for full realization of these requirements in real terms. In this case Germany is in a better position than many of the other European countries.

4.2. Negative cases

The materials achieved from particular countries do not give sufficient information to choose among them the case, which could be determined as a “negative case”. For sure, it is difficult to find a negative case among such countries as Denmark, Finland and Sweden. During many decades these countries have developed and improved their tariff systems in the sector of water supply and sewerage. In this respect each of these countries can be considered as a positive case. However, just these countries can be also the negative cases, because they are not considering environmental charges in their tariff systems for households. Because of that the tariff systems in these countries can not be recognized as fulfilling requirements of the European Community, determined in the Directive 2000/60/EC. On the other hand it can be stated that an appropriate correction of the tariff systems in these countries will

be not too difficult. Besides, in these countries a very important rule of full recovery of direct water costs is implemented (operation and maintenance costs plus capital costs).

Selection of a negative case from among such countries as Estonia, Latvia, Lithuania and Poland is not possible because of not sufficient range of materials submitted by these countries. Apart from that the timing for such selection is not appropriate. All above mentioned countries set lately new legal grounds concerning charges for the use of environment and charges for water supply and sewerage services. The new provisions are directed on the implementation of rules determined by the Directive 2000/60/EC. These countries are just starting implementation of the new provisions and do not have at this moment experiences resulting from them. In each of these countries the detailed rules concerning determination of environmental charges and tariff rates for water supply are different. Achievement of correct ambitious goals resulting from the new legislation will be very difficult in each of these countries. High needs in the range of extension of accessibility of water supply and sewerage services for the population and reduction of the gap in the development of systems of water resources management and of water quality protection are meeting, in these countries, the barrier of population's ability to pay. The population's ability to pay is in these countries low, because of small households budgets and low GDP per capita.

5. EFFECTS ON THE WATER ENVIRONMENT AS A RESULT OF USED MEASURES

Information collected from the 8 investigated Baltic Sea countries do not give a possibility to determine substantial quantized effects of the influence of the tariff systems on the water environment. However, on the basis of Review of Water Pricing in EU elaborated by Eva Roth (EEB, 2001), general notes concerning this matter can be presented.

In the investigated Sea countries evident is the decrease of water consumption in households as well as in other sectors. In Estonia, Latvia, Lithuania and Poland during the last decade water consumption decreased dramatically. Table 9 shows, as an example, the trend of changes of unit water consumption by households in Polish towns and in Germany. Making real costs, that means increase costs for water and wastewater can be the cause for the decrease of water consumption. However, it is not the only reason of this phenomenon, because essential is, in the case of Estonia, Latvia, Lithuania and Poland, the availability of good quality fittings used in indoor water installations, what allows to eliminate water leakage in houses. In previous years this type of losses was significant and even had a rising trend. However, the rise of prices for water supply and wastewater had a significant influence on rationalization of water consumption and liquidation of its waste, because it was an important sign for the population, showing them the value of water. The rise of rates of charges for water supply and sewerage services creates also an impulse to reduce water leakage in water network. The increased rates of charges are causing higher interest of population and local authorities, what in turn is giving enterprises an impulse for reduction of the prime costs. Limitation of water leakage in water network is an efficient activity causing decrease of the variable costs in the enterprises and reduction of charges for water abstraction from water resources.

Table 9. Decrease of specific water consumption in household in Poland, Germany and in Lithuania during the period 1990-2000.

Year	Specific water consumption l per capita per day			
	Poland[1)]	Germany[2)]	Lithuania[3)]	
			Daugavpils	Siauliali
1990	209.6	145.0		
1991	203.0	139.0	394.0	383.0
1992	203.0	136.0	367.0	338.0
1993	194.8	136.0	336.0	272.0
1994	187.8	134.0	297.0	254.0
1995	173.6	132.0	274.0	206.0
1996	162.1	128.0	268.0	170.0
1997	154.4	130.0	245.0	135.0
1998	146.6	129.0	236.0	106.0
1999	136.2	128.0	208.0	89.0
2000	129.8	129.0	184.0	82.0

1) In towns – l per inhabitant served by public water network per day. Source: Statistical Yearbook of the Republic of Poland. 1991-2001.
2) Sources: Globus, statistische Angaben. Bundesverband der deutschen Gas- und Wasserwirtschaft (KA-Wasserwirtschaft, Abwasser, Abfall 2002(49) No 2); BGW Statistical data.
3) According to data given by Mr I.Kiskis (World Bank, Lithuania).

Environmental effects of reduction of water consumption are positive indeed, because they allow limiting the use of water resources. It leads also to reduction of the impurities ballast contained in wastewater disposed to receiving water – in case of standards concerning impurities concentration in disposed wastewater, the reduction of volume of wastewater causes the reduction of the value of the disposed load of impurities. Reduction of water consumption allows also limitation or even stoppage of some investment projects, what has also various positive impacts.

Reduction of water consumption has also other effects, which can be recognized as negative. It results in a decrease of the water velocity in water pipes and it cause that water stays longer in them what has an unfavorable influence on the quality of water supplied to customers (such phenomenon was noticed in Estonia, Latvia, Lithuania and Poland). Also some difficulties are noticed in treatment of wastewater, because by lower consumption water wastewater contains higher concentration of

impurities. However, these are problems which water supply and sewerage companies have to deal with. The other negative result of increasing the prices for water supply and sewerage services can be withdrawal of industrial plants from communal water supply and sewerage systems and the use, instead of their own water intakes and wastewater treatment plants. It can be prevented by application of an adequate tariff system directed to the industrial sector. In such system should not be place for cross-subsidy, of course.

Introduction of environmental charges into the price of water supply and sewerage allows collecting financial funds for improvement of management of water resources and protection of their quality. The real quantitative value of effects obtained in this way is difficult to establish in this report.

Generally can be stated that the rise of prices for water supply and sewerage services through their approach to the real costs and through introduction the environmental charges to them can bring positive effects for the water environment. Unfortunately, simultaneously this increases the encumbrance of household budgets. Because of that the activities in this direction have to be well balanced and realized gradually so not to exceed the barrier of population's ability to pay – it is especially important in Estonia, Latvia, Lithuania and Poland where the average income of the households and GDP per capita are very low.

ANNEX I

1. SYNTETIC PRESENTATION OF THE DATA CONCERNING PAYMENTS FOR WATER SUPPLY AND SEWERAGE SERVICES IN PARTICULAR BALTIC SEA COUNTRIES

1.1. Denmark

1.1.1. General data concerning water resources and the population served by public water supply and sewerage

Average annual renewable water resources of Denmark are 2264 m^3 per capita per year. Water abstraction for public supply of the population amounts to 417 mill. m^3/year (2000). This amount is covered almost in full by the resources of ground water (99.6%). The public water supply is used by the about 95%, and the public sewerage by about 95% of the whole population of the country (1997).

1.1.2. The basic legal acts concerning the tariff policy within the sector of water supply and sewerage system

The recent governmental regulation (1996) imposes an obligation on water utilities to ensure that all properties connected to the public water supply have a meter installed. Furthermore, payment for water deliveries must be made via a combination of a fixed charge and volumetric charge (OECD. The Price of Water. Trends and OECD countries. OECD Paris 1999).

1.1.3. Environmental charge

In Denmark there are no charges for water abstraction and for disposal of wastewater to receiving water. However, the water tax and the wastewater tax are applied.

1.1.4. Tariff structures applied

The charges for water supply services rendered to households are collected mainly according to a tariff which consist of two parts: the first is a fixed charge, the second a volumetric charge dependent on the amount of the delivered water (fixed charge amounts to about 41% of the whole charge for water supply services). In reference to the sewerage services rendered to households a uniform volumetric tariff, determined for 1 m^3 of sewage is applied. However the two-part tariff have been implemented on a voluntary basis. Charges for sewerage services rendered to households are established on the base of the measurement of water consumption. Separate charges for disposal of rainwater to the rainwater drainage are also applied. The local council is responsible for approving tariffs and tariff structure.

1.1.5. The level of the prices

Average charges for households according to data from 2001 amount to:

- in relation to water supply services
  - volumetric tariff 4.45 DK/m^3 (0.61 EURO/m^3)
  - fixed charge 308 DK/m^3 (41.92 EURO/m^3)
- in relation to sewerage services
  - volumetric tariff 16.60 DK/m^3 (2.26 EURO/m^3)
  - fixed charge 74.40 DK/m^3 (10.16 EURO/m^3).

Additionally to these comes water tax at 5 DK/m^3 (0.68 EURO) and wastewater tax at 0.5 DK/m^3 (0.068 EURO/m^3) and finally a VAT (general salex tax) at 25% is levied on the total sum of charges and tariffs.

Total average charges for the consumer (for water supply and sewerage services) according to data from 2002 amount to 32.08 DK/m^3 (4.37 EURO/m^3).

1.1.6. The level of the coverage of costs of services by charges

The water supply act and the waste water tariffs act explicitly states that the cost of water supply and waste water treatment should be covered in full by the charges. In general, charges do not cover environmental cost. However, it possible for water

company to include costs for water source protection in the charges. For instance it is possible for water company to compensate farmers for a reduced application of fertilizers or pesticides. The water tax and the waste water tax are a part of revenue of Danish State and are not earmarked for environmental expenditure.

1.1.7. Intended changes in the tariff policy during the coming years

No general changes in tariffs and taxes are planned.

1.2. Estonia

1.2.1. General data concerning water resources and the population served by public water supply and sewerage

Average annual renewable water resources of Estonia are 11290 m^3 per capita per year. Water abstraction for public supply of the population amounts to 60 mill. m^3/year. This amount is covered by the resources of ground water in about 65% and by the resources of surface water in about 35%. About 77% of the whole population of the country uses the public water supply and about 60% the public sewerage system.

1.2.2. The basic legislation concerning the tariff policy within the sector of water supply and sewerage system

The main legal acts concerning the tariff policy within the sector of water supply and sewerage are:

- Water Act (1994 – with later amendments),
- Public Water Supply and Sewerage Act (2000),
- Pollution Charge Act (1999),
- Act on Water Supply and Sewerage Network (1999).

Public Water Supply and Sewerage Act provides, that the prices for water supply and sewerage services should be established in a way to ensure for the water company:

- the coverage of the operation and maintenance costs,
- the possibility to fulfill the requirements concerning the quality and reliability of services,
- the possibility to fulfill the requirements concerning environmental protection,
- the functioning of the enterprise with a substantial profit.

Apart from that, in accordance with the Public Water Supply and Sewerage Act the prices for water supply and sewerage services cannot discriminate any of the groups of recipients of the services. The local authorities (municipal or rural) establish the prices for these services.

1.2.3. Environmental charges

In Estonia charges for abstraction of water from water resources and for disposal of wastewater to receiving water are applied. These charges are included in the fees for water supply and sewerage services.

Charges for water abstraction depend on the quantity of water, type of water (ground, mineral, mine, surface water) and on the intended use of the taken water. Charges for the disposal of wastewater to receiving water depend on the quantity and type of substances in the disposed wastewater and on the type and localization of the receiving water. Charges are increased in case of disposal of not treated or partially treated wastewater.

1.2.4. Tariff structures applied

There are two types of tariffs in Estonia:

1) a fixed charge – for customers who do not have water meters
2) a uniform volumetric tariff (unipart) - for customers who have water meters.

In 1999 over 50% of inhabitants using the public water supply system took water counted by means of water meters. A significant increase of the number of water meters is foreseen and it is a goal to have all water supply connections equipped with water meters. Fixed charge tariffs are established on the base of normative quantities of water consumption and the number of inhabitants in the given household. The rate

in the volumetric tariff (price for 1 m^3) depends on the costs of water supply and sewerage services in the given locality.

1.2.5. The level of the prices

According to data from the year 2000 the range of prices for households amount to:

- in relation to water supply services 4.0 - 8.3 EEK/m^3 (0.25-0.52 EURO/m^3)
- in relation to sewerage services 3.2-15.3 EEK /m^3 (0.2-0.96 EURO/m^3).

1.2.6. The level of the coverage of costs of services by charges

As for today, the charges for water supply and sewerage services do not fully cover the costs of these services. Roughly it might be estimated, that the present level of joint charges for water and wastewater constitute about 30% of the full costs of these services. The main cause of this situation is relatively low income of the people. It has been estimated, that if the economic development of the country will be sufficient high, then the full coverage of costs of water supply and sewerage services by fees collected for these services can be real after 10 – 15 years.

1.2.7. Intended changes in the tariff policy during the coming years

Activities foreseen in the tariff policy concern mainly the gradual implementation of general rules, which emerge from the lately issued Act on Water Supply and Sewerage. A perspective goal of these activities is to achieve, in an appropriate time, a full coverage of service costs by charges. It is also considered to undertake activities, which shall diminish the differentiation of charges for these services in the whole country and liquidate the unfounded differences in charges for services rendered to the same category of recipients of these services.

1.3. Finland

1.3.1. General data concerning water resources and the population served by public water supply and sewerage

Average annual renewable water resources of Finland are 21153 m^3 per capita per year. Water abstraction for public supply of the population amounts to about 404 mill. m^3/year (1999). This amount is covered by the resources of ground water in about 58% and by the resources of surface water in about 42%. About 90% of the inhabitants use the public water supply and 80% the public sewerage system. The given percentage figures indicate people connected to the public water supply and sewerage systems. The remaining population is connected to private enterprises or individual systems. Actually about 99% of the population has water supply and sewerage through pipes.

1.3.2. The basic legal acts concerning the tariff policy within the sector of water supply and sewage system

The basic legal act concerning the tariff policy in the sector of water supply and sewerage is Water and Sewerage Services Act (2001).

1.3.3. Environmental charges

In Finland there are no charges for water abstraction from water resources and for disposal of wastewater to the receiving water in the range of services rendered to the households.

1.3.4. Tariff structures applied

There is applied a two-part tariff consisting of a fixed charge and a volumetric charge, which depends on the quantity of delivered water or the quantity of disposed wastewater (the fixed charges covers 20% of the total charges for the water supply or sewerage services).

1.3.5. *The level of the prices*

According to data from the year 2001 the range of prices for households amounts to:

- in relation to water supply services - 0.8-1.3 EURO/m^3
- in relation to sewerage services - 1.2-1.6 EURO/m^3

1.3.6. The level of the coverage of costs of services by charges

The charges are covering 100% of costs of services. They embrace operation and maintenance costs, investments costs and profit. It should be mention that the environmental charges are not included in the charges (concerning water abstraction from water resources and disposal of wastewater to receiving water).

1.3.7. Intended changes in the tariff policy during the coming years

It is considered to increase the share of the fixed charge in the whole charge – maximum up to 30%.

1.4. Germany

1.4.1. General data concerning water resources and the population served by public water supply and sewerage.

Average annual renewable water resources of Germany are 2171 m^3 per capita per year. Water abstraction for public supply of the population amounts to 5810 mill m^3/year (1995). This amount is covered by the resources of ground and spring water in about 70% and by the resources of surface water in about 30%. About 98% of the whole population of the country uses the public water supply and 92% the public sewerage system.

1.4.2. The basic legislation concerning the tariff policy within the sector of water supply and sewerage system

The basic legal acts are the Municipal Finance Acts (Kommunal-abgabengesetze) issued in the particular German Länder. From these regulations arises, that the tariff for water supply services shall be oriented in such way to cover the total costs of water supply and provide an appropriate return capital.

From the Municipal Finance Acts issued by the particular German Länder result also the following general rules concerning charges for sewerage services:

- the capital expenditures for the sewerage system should be covered by a single fee for connection of the property to the sewerage system and by yearly fixed investment fees,
- charges for sewerage services can not exceed their costs,
- the charges shall be proportional to the differentiated costs of sewerage services of varies classes of sewerage users.

Federal Constitution (Grundgesetz) provides that all citizens should have equal rights. In case of the charges for water supply and sewerage services this rule is realized in such a way that it is not possible to treat any of the recipients of the services in a preferential way.

Within the frames of regulation issued by the particular German Länder the particular communities have a wide freedom in setting the tariffs – according to local conditions. Because of that the rates for water supply and sewerage services are in Germany very differentiated.

1.4.3. Environmental charges

In Germany charges for water abstraction from water resources are applied. These charges are different in the particular German Länder and they are different for abstraction of ground water and for abstraction of surface water. In some cases they on the intended use of the drawn water. These charges are included in the fees charged for water supply services. Apart from the charges for water abstraction administrative fees for issuing a permission for water abstraction are also applied.

In Germany charges are also applied for disposal of wastewater to the environment. The base for the application of these charges is the Federal Law which realize the "polluter – pays – principle" of the European Union, according to which one who pollutes the environment must pay for it. The charges for the disposal of wastewater depend on the type and quantity of pollution in the wastewater discharged to the environment (the charge is related to the pollution unit, which includes defined quantities of pollution depending on the type of substances that create the pollution). The charges for the disposal of wastewater to the environment are included in the charges for sewerage services. Apart from the charges for the disposal of wastewater into the environment, which resulting from the Federal Law, in particular German Länder administrative fees for issuing a permission for disposal of wastewater are also applied. These fees depend on the quantity of the disposed wastewater (expressed by the number of equivalent inhabitants), type of wastewater and the type of receiving water.

1.4.4. Tariff structures applied

In Germany the charges for water supply services are collected according to a tariff which consists of two parts: the first is a fixed charge, the second a volumetric charge dependent on the amount of the water used. The level of the fixed charge differs a lot in particular water supply systems; it constitutes on average about 9% of the total charge, in spite of the fact, that the share of the fixed costs in the total costs of the water supply services range from 85% to 90%.

The charges for sewerage services for households are usually calculated on the base of water consumption - a tariff is applied, which consisting of two parts: the first is a fixed charge, the second a volumetric charge. Sometimes the charges for rainwater disposed from roofs and the surface of the land are applied – in that case the structure of the tariff is more complicated.

In case of disposal of industrial wastewater to the municipal sewerage system, apart from the quantity of wastewater also the type and quantity of wastewater pollution, expressed in adequate parameters (suspended solids, BOD_5, COD and so on) are taken into consideration. In that case the tariff has a multi-part structure. In

some towns in Germany there are separate charges for disposal of rainwater to the sewerage system, depending on the surface from which the rainwater is disposed – in such case the yearly fee relates normally to $1m^2$ of this surface.

1.4.5. The level of the prices

The range of the prices for water supply services for households according to data from 1998 has been from 1.6 DM/m3 (0.8 EURO/m^3) to 5.0 DM/m^3 (2.5 EURO/m^3)

The range of the prices charges for sewerage services for $1m^3$ paid in DM is similar to the above mentioned prices of water. The price for sewerage services rendered to the households evaluated on the base of the data from 1997 is 224 DM (112 EURO) per inhabitant per year

1.4.6. The level of the coverage of costs of services by charges.

The grade of the coverage of costs of water supply and sewerage services is relatively high in Germany, but it does not reach 100%.

According to evaluations made on the base of the data from 1996 the charges cover the costs of services:

in 97% - in relation to water supply services and,

in 75% - in relation to sewerage services .

1.4.7. Intended changes in the tariff policy during the coming years

No substantial changes have been considered.

1.5. Latvia

1.5.1. General data concerning water resources and the population served by public water supply and sewerage

Average annual renewable water resources of Latvia are 11840 m^3 per capita per year. Water abstraction for public supply of the population amounts to 120 mill. m^3/year. This amount is covered by the resources of ground water in about 47% and by the resources of surface water in about 53%. About 82% of the whole population of the country uses the public water supply and about 68%[1)] the public sewerage system.

1.5.2. The basic legislation concerning the tariff policy within the sector of water supply and sewerage system

The main legal acts concerning the tariff policy within the sector of water supply and sewerage are:

- Law on Regulators of Public Services (2001),
- Law on Natural Resources Tax (1995,1996),
- Law on Management of Water Resources (has been elaborated).

The methodology of calculation of the tariff charges within the sector of water supply and sewerage is defined by the Cabinet of Ministers.

The legislative rules establish that the charges for water supply services should be defined in such a way that the fees collected from the customers shall cover the costs of services and shall assure an appropriate profit. Municipalities set up the tariffs. The legislative rules mentioned above are at this moment at an implementation stage and there is no experience related to their application.

1) Rough number according to the own estimation of the author of this report

1.5.3. Environmental charges

In Latvia charges are applied for abstraction of water from water resources and for disposal of wastewater to receiving water. These charges are included in the charges for water supply and sewerage services. The level of the charges for water abstraction depends on the type of taken water (ground, surface, therapeutic- mineral, mineral drinking water and thermal water). These charges are not differentiated in respect to the rivers basins, sectors and so on.

Charges for pollution load in wastewater disposed to receiving water are set up by the Council of Ministers. The rates of the charges are related to 1 tone of substances and depend on the type of substance (distinguished are: not dangerous substances, moderately dangerous substances, dangerous substances, especially dangerous substances). These charges are not differentiated in respect to the rivers basins, sectors and so on.

1.5.4. Tariff structures applied

Two types of tariffs are applied:

1) a fixed charge tariff – for customers who do not have water meters,
2) a uniform volumetric tariff (unipart) - for customers who have water meters.

About 60% of inhabitants who use the public water supply system took water counted by means of water meters.

Rates for households and industry are till now established in such way, that the industry subsidized very often the inhabitants in the range of charges for water supply and sewerage services.

1.5.5. The level of prices

The range of prices for households according to data from the year 1998 amounts to:

- in relation to water supply services 0.054 -0.5 LVL/m^3 (0.10-0.96 EURO/m^3)
- in relation to sewerage services 0.68-1.12 LVL/m^3 (1.13-2.16 EURO/m^3).

1.5.6. The level of the coverage of costs of services by charges

Charges for water supply and sewerage services do not fully cover the costs of these services. Charges for these services take into account the operation and maintenance costs. Investment cost are subsidized, in a considerable range, by the State Budget, and the Latvian Environment Protection Funds, and also by bi- and multilateral donors. Quite a few projects have used leans from IFIs to modernize their facilities.

1.5.7. Intended changes in the tariff policy during the coming years

It can be anticipated that in relation to the intention of intensive activities to implement the EC Directives (including the framework Water Directive) there will be also an improvement of the tariff system within the sector of water supply and sewerage. The experience emerging from the implementation of lately constituted legislative rules can be an impulse for these changes.

1.6. Lithuania

1.6.1. General data concerning water resources and the population served by public water supply and sewerage

Average annual renewable water resources in Lithuania are 7043 m^3 per capita per year. Water abstraction for public supply of the population amounts to 133 mill m^3/year (2000). This amount is covered mainly by the resources of ground water. The public water supply is used by about 66.4% (roughly estimation) of the whole population of the country and the public sewerage system is used by about 58.2% of them (data from 2000).

1.6.2. The basic legal acts concerning the tariff policy within the sector of water supply and sewerage system

The main legal acts concerning the tariff policy within the sector of water supply and sewerage system are:

- Water Law on Fees for the Use of State Natural Resources (adopted by the Parliament in 2000),
- Law on Environmental Pollution Taxes (adopted by the Parliament in 1999),
- The Methodology on estimation of damage/harm made to the environment under disturbance of environmental protection law (issued by the Ministry of Environment in 1991),
- The Methodology of determination of tariffs (costs) for water supply and wastewater treatment (issued by The State Pricing and Energy Control Commission in 2001).

According to the new regulations, methodology of determination of tariffs is developed in order to achieve the following:

- to ensure quality of services, environmental protection, sanitary and hygienic requirements,
- to ensure the profitability of water supply companies,
- to ensure the right prices for all water user groups.

1.6.3. Environmental charges

In Lithuania charges are applied for abstraction of water from water resources and for disposal of wastewater to a receiving water. These fees are included in the charges for water supply and sewerage services. The charges for water abstraction depend on the type of drawn water and on this for what purpose it is intended. Charges for water drawn for household use are applied if it is water from underground resources, charges for abstraction of surface water intended for household use are not foreseen (in Lithuania households are supplied with water drawn from underground resources). Charges for disposal of wastewater to receiving water depend on the quantity and type of substances present in the wastewater discharged.

1.6.4. Tariff structures applied

There are three types of tariffs in Lithuania:

1) an volumetric tariff (unipart) – determined for 1 m^3 of water or for 1 m^3 of wastewater calculated as a quotient of the indispensable expenses and the quantity of sold water or disposed wastewater which has been received by the sewerage system,
2) a two-part tariff consisting of a fixed charge and a volumetric charge which depends on the quantity of delivered water or the quantity of disposed waste water (the fixed charge covers 30% of total charge) - this is possible according to legislation, but not a single water utility uses it at the moment (July 2002),
3) fixed charge tariff – for customers who do not have water meters.

1.6.5. The level of the prices

According to data from the year 2000 the range of prices for households amounts to:

- in relation to water supply services 0.83-2.77 Lt/m^3 (0.23-0.76 EURO/m^3)
- in relation to sewerage services 0.83-4.35 Lt/m^3 (0.23-1.2 EURO/m^3)

1.6.6. The level of the coverage of costs of services by charges

According to the new regulations, charges for water supply and sewerage services shall cover not only the costs of operation and maintenance but also the costs of modernization and development of the water supply and sewerage systems. It can be anticipated that the present charges do not cover the total costs of water supply and sewerage services as well as the real environmental costs.

1.6.7. Intended changes in the tariff policy during the coming years

The lately introduced Regulations concerning the tariff policy refer to the Framework Water Directive of the European Community (2000/60/EC) and are aimed to achieve a full coverage of costs by charges in the future. During the next years it will be an important task to implement the new regulations into practice and it can be anticipated that changes of the present regulations are not considered.

1.7. Poland

1.7.1. General data concerning water resources and the population served by public water supply and sewerage.

Average annual renewable water resources of Poland are 1580 m^3 per capita per year. Water abstraction for public supply of the population amounts to 2350 mill. m^3/year (2000). This amount is covered by the resources of ground water in about 63% and by the resources of surface water in about 37%. About 86% of the whole population of the country uses the public water supply and about 56% the public sewerage system.

1.7.2. The basic legislation concerning the tariff policy within the sector of water supply and sewerage

The main legal acts concerning the tariff policy within the sector of water supply and sewerage are:

- Law on Environmental Protection (2001),
- Act on Collective Water Supply and Collective Wastewater Disposal (2001),
- Regulation of the Minister responsible for the Environment concerning charges for the use of the environment (2001),
- Regulation of the Minister responsible for Infrastructure concerning charges for the collective water supply and collective wastewater disposal (2002).

New legislative acts refer to the Water Framework Directive of EC (200/60/EC). In accordance to the obligatory law, tariffs of charges for water supply and sewerage services shall ensure:

- to obtain an indispensable income on a level that will assure self-financing of the activities of the water enterprise and a profit,
- protection of customers of these services against unfounded raise of prices and charges,
- elimination of throughout subsidizing,
- motivating customers of services to a rational use of water and to limit pollution of sewerage,

- an easy way for customers to calculate charges and to check the height of payments and prices, which concern them.

A proposal of tariffs is elaborated by the enterprise conducting water supply and sewerage services, ratification is done by resolution of the commune council.

1.7.3. Environmental charges

In Poland charges are applied for abstraction of water from water resources and for disposal of wastewater to receiving water. These charges are included in the fees for water supply and sewerage services.

Charges for abstraction of 1 m^3 of water depend on the type and quality of water and also on the accessibility to water resources in particular areas of the country. Charges for the disposal of wastewater to receiving water depend on the quantity and type of substances in the disposed wastewater. In case when wastewater is discharged without a necessary permission, higher charges are applied. There are also charges for disposal of rainwater and melting water to receiving water by sewerage system. In that case charges depend on the type and size of the drained area. Environmental charges for disposal of rain- and melting water are a novelty in the Polish legislation and a system to include them into the charges for sewerage services has been not elaborated till now.

1.7.4. Tariff structures applied

There are three types of tariffs in Poland:

1) a fixed charge tariff applied in case when an use of water meters is not possible,
2) a directly proportional volumetric tariff based on a charge rate for 1 m^3 of water or sewerage – in that case it is indispensable to use a water meter and eventually a devise for measurement of the disposed sewerage,
3) a two part tariff consisting of a fixed charge and a volumetric charge dependent on the quantity of delivered water or the quantity of disposed wastewater.

The directly proportional volumetric tariff based on a charge rate for 1 m^3 of water or sewerage is till now in general use. Very often differentiated charges are

applied for different classes of recipients of the services; for example - charges for households and for the industry are different. New legislation promote a two-part tariff (a fixed charge and a volumetric charge) and it is anticipated that this type of tariff will, in the future, be dominant in Poland. A fixed charge tariff is not widely used, because the measurement of water delivered to the customers is obligatory. This tariff is used mainly in cases when the water meter is out of order and must be replaced.

The amount of sewerage is calculated on the base of water consumption. Industrial enterprises can install separate devices for the measurement of the quantity of sewerage and in that case charges for sewerage are established on the base of this measurement.

1.7.5. The level of the prices

According to data from the year 2001 the range of prices for households amounts to:

- in relation to water supply services 1.0 -3.3 PLN/m^3 (0.27-0.92 EURO/m^3)
- in relation to sewerage services 1.0-3.50 PLN /m^3 (0.27-0.97 EURO/m^3).

1.7.6. The level of the coverage of costs of services by charges

At this moment, the charges do not fully cover the costs of services. This situation differs a lot depending on the area of the country. In rural areas the charges cover very often only the operation costs. In many towns the charges cover operation costs and a part or the whole of amortization costs. In some towns charges cover operation costs and the full amortization costs and allow a small profit. But it is not possible to cover investment costs connected to modernization of the existing technological systems or their extension. New regulations concerning tariffs for water supply and sewerage services being implemented at this moment aim to obtain a full coverage of the service and environmental costs. Achievement of this goal must be realized in many stages and will need a longer time. It depends on the limited payment ability of the population.

1.7.7. Intended changes in the tariff policy during the coming years

Because it is considered to improve the system of environmental charges and the tariff system, an amendment of the present regulations is foreseen.

1.8. Sweden

1.8.1. General data concerning water resources and the population served by public water supply and sewerage.

Average annual renewable water sources of Sweden are 19999 m^3 per capita per year. Water abstraction for public supply of the population amounts to 923 mill m^3/year (1995 r.). This amount is covered by the resources of ground water in about 24%, by the resources of artificial ground water in about 25%, and by the resources of surface water in about 51%.

The public water supply is used by about 86% of the whole population of the country and the public sewerage system by 86% of the population (1997).

1.8.2. The basic legislation concerning the tariff policy within the sector of water supply and sewerage system

According to Swedish law, tariffs charges should cover only necessary costs without profit.

1.8.3. Environmental charges

Application of charges for water abstraction and the discharge of wastewater to receiving water is at this moment just being discussed.

1.8.4. Tariff structures applied

In Sweden the charges for water supply services are collected according to a tariff which consist of two parts: a fixed charge and a volumetric charge dependent on

the amount of the water used. The share of the fixed charge constitutes on average about 32% of the total charge.

The charges for sewerage services are elaborated in a similar way (the share of the fixed charge constitutes also 32% of the total charge). There are tendencies to rise the share of the fixed charge in the total charge – in Stockholm such a change has been already introduced without increasing the total income of the Stockholm water authority. Charges for disposal of storm water to the sewerage system were introduced in September 2000 as an environmental charge. This yearly charge is calculated per m^2. hard-surfaced area of the property. Properties where storm-water can be filtrated in the ground are not charged.

1.8.5. The level of the prices

According to the data from 1998 the average level of prices for households amounts to:

- in relation to water supply services - 8.3 SEK/m^3 (1.15 EURO/m^3),
- in relation to sewerage services - 12.4 SEK/m^3 (1.7 EURO/m^3).

Charges introduced for disposal of storm-water in Stockholm amount to:

1.6 - 3.3 SEK (0.22 - 0.46 EURO) per m^2 of hard-surfaced area per year

1.8.6. The level of the coverage of costs of services by charges.

Exact data concerning the coverage of costs for water supply and sewerage services by charges in Sweden is not available. But it can be anticipated, that when considering about the coverage of the direct costs of services only, the grade of coverage is nearly 100% as subsidies are common.

It is generally estimated, that in Sweden the charges cover about 98% of operational and capital costs of the water supply services and that in a similar range the operation and capital costs for sewerage services are covered. It shall be taken into consideration, that till now, with few exceptions, the charges for water supply and sewerage services in Sweden do not include environmental charges.

1.8.7. Intended changes in the tariff policy during the coming years

It is considered to introduce charges for the use of the environment: for abstraction of water from the water resources and for the disposal of wastewater to the receiving water.

2. SUMMARY OF INFORMATION ON WATER TARIFF POLICY IN THE EU

The main direction of policy with regard to the water tariffs in the European Community is defined by the Directive 2000/60/EC establishing a framework for the Community action in the field of water policy. According to Article 9 Member States shall take into account the principle of recovery of the cost of water services, including environmental and resource costs, with regard to economic analysis and in accordance with the polluter pays principle (Box 1). On this base, the idea is developed to consider full costs for water services in the tariffs of charges. Costs of services shall take into consideration:

- financial costs of water services (all operation and maintenance costs and capital costs – principal and interest payment – and return on equity where appropriate),
- environmental costs (the cost of damage that water users impose on the environment),
- resource costs (the cost of foregone opportunities which other users suffer due to the depletion of the resource beyond its natural rate of recharge and recovery).

Full cost recovery of water services is a goal which the countries of the European Community shall achieve in the future – in a real term. The present state on the field of water pricing and recovery of the costs of water service can be in short characterized as follows.

Tariff structures and levels

The most often used is a two-part tariff (fixed charge plus volumetric charge), but the flat-rate tariff is also used.

The level of water price in EU countries is generally lower than the level of cost recovery.

Prices of water are in the EU very differentiated. Different level of service costs recovery by charges and a different level of environmental charges included in the price accompany this differentiation.

Box 1. Cost recovery of water services in European Union Water Framework Directive

Article 9
1. Member States shall take account of the principle of recovery of the costs water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.

Member States shall ensure by 2010
- that water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives of this Directive,
- an adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services, based on the economic analysis conducted according to Annex III and taking account of the polluter pays principle.

Member States may in so doing have regard to the social, environmental and economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected.

2. Member States shall report in the river basin management plans on the planned steps towards implementing paragraph 1 which will contribute to achieving the environmental objectives of this Directive and on the contribution made by the various water users to the recovery of the costs of water services.

3. Nothing in this Article shall prevent the funding of particular preventive or remedial measures in order to achieve the objectives of this Directive.

4. Member States shall not be in breach of this Directive if they decide in accordance with established practices not to apply the provisions of paragraph 1, second sentence, and for that purpose the relevant provisions of paragraph 2, for a given water-use activity, where this does not compromise the purposes and the achievement of the objectives of this Directive. Member States shall report the reasons for not fully applying paragraph 1, second sentence, in the river basin management plans.

Environmental charges

Abstraction charges and pollution charges are applied.

Abstraction charges are applied in the majority of EU countries, but not in all. They are often differentiated, depending on the type of water, accessibility of water resources and also on the type of the water user.

In seven countries of EU pollution charges are not used, and in three others they are just under discussion. These charges depend on the quality of wastewater disposed

to a receiving water. But in principle they do not consider full costs of damages caused by pollution of environment.

Subsidies

Subsidizing of water supply and sewerage services occurs on a smaller or bigger scale nearly in all countries, because charges do not fully cover costs of these services. Subsidized are most frequently investment costs. There are also additionally cross-subsidies because very often tariffs of charges for different classes of water users are not settled in conformity with the real costs of services rendered. Environmental protection is also subsidized, because costs of losses caused by water consumption or pollution of the environment are not fully considered in environmental charges.

The situation presented above shows that EU countries are still far away from reaching the postulated state of full recovery of costs of water supply and sewerage services (taking into consideration environmental costs and resources costs). Some countries are close to this goal and some still far away. Because of that EU countries are elaborating their strategies to reach the state of Full Cost Recovery.

3. SUMMARY OF INFORMATION ON THE APROACH OF IFI TO WATER TARIFF POLICY

In the opinion of the European Investment Bank it is emphasized that the Water Framework Directive (2000/60/EC) establishes a legal context for enterprises undertaken during the coming years by EU countries in the water sector. Attention is paid to the fact that this Directive embraces economic instruments in the form of tariffs that assure an adequate cost and motivation prices recovery for the purpose to promote sustainable management of water resources. These instruments shall serve to diminish the volume of water consumption and to improve the quality of water resources.

Increase of tariff charges necessary to increase the level of cost recovery must be introduced in such a way that will be socially accepted. It must be also considered to assure a basic range of water supply and sewerage services for poor families.

Subsidizing water supply and sewerage services (i.e. by the budget of EU) should be used as a buffer for increase of tariffs, so that their level could be socially accepted. Subsidies must be allocated, in first place, for enterprises that will serve environmental protection. If, despite of subsidizing, the socially acceptable level of tariffs will not be achieved then it should be considered to perform the investments in phases.

Application of the principle of recovery of the costs of water services and the polluter pays principle gives implications in order to have the cost of investments, which are not subsidized, covered by tariff charges and not by tax payers via municipal budget.

In the opinion of European Bank for Reconstruction and Development[1] it is emphasized that there are several reasons in favor of full-cost-recovery for the water company:

[1] According to the informal note prepared by Mr Chris Shugart from Municipal and Environmental Infrastructure team EBRD, upon the request of author of this Report. The views expressed in this note do not necessarily reflect the official position of the EBRD.

- a management has control over funds needed to run the business and does not have to depend on possibility unreliable subsidies from the local or central government and on decisions about investments made by distant government officials,
- financial self-sufficiency of the company reduces the drain on local and central governments budgets, allowing them to be used for other purposes,
- because of the dead-weight loss associated with taxes in the country, sourcing the funds from the general budget may involve greater welfare costs than sourcing the funds by increasing tariffs.

Considering the adequate cost recovery level in the case of water services, it should be stated that each user should pay for the costs that his consumption imposes on the system. The really difficult question is how to allocate the common fixed costs of the system among different services users. Individual countries or cities adopt various rules for the allocation of common costs for the water utilities. Whatever rules are adopted, there are below mentioned points that should be considered:

- the rules must be perceived as fair to customers of different categories,
- care should be taken to avoid price schedules that cause grossly inefficient outcomes,
- the rules should be administrative simple.

The specific maximum percentage share of expenditures in the household budget for water services should be determined for each country according to its social and economic conditions. A useful rule thumb has developed according to which the percentage of disposable household income spent on water and wastewater services should not exceed 3-5%. However, if the population accepts paying more than that, there is no objective reason why they should not do so.

ANNEX II

DOCUMENTS AND PUBLICATIONS USED AS A BASE FOR THE REPORT

Basic documents and publications received from HELCOM Secretariat

1. EUROPEAN COMMISSION. European Communities: "Database on environmental taxes in the European Union Member States, plus Norway and Switzerland. Evaluation of environmental effects of environmental taxes". Final report, August 1998 (153 pages).
2. ESTONIA. The Ministry of Environment of Estonia: "Water pricing in Estonia" (6 pages).
3. Peter Kessler and Walter Kahlenborn: "Full Cost Recovery in Germany" (8 pages).
4. R. Andreas Kraemer, Michael Strübin, Wenke Hansen: "Money Flows: Economics of Water Supply and Sewerage in Germany". Contribution to the Research Project "Water 21- Towards Sustainable European Water Management". December 1998 (28 pages).
5. LATVIA. HELCOM PITF 18/2001, INF.5 (meeting document): "Application of water pricing and full cost recovery" (1 page).
6. LITHUANIA. Ministry of the Environment: "The Republic of Lithuania – Water pricing and cost recovery in water sector" (5 pages).
7. POLAND. HELCOM PITF 18/2001, 5/4 (meeting document): "Water pricing and cost recovery in water sector in Poland" (3 pages).
8. Swedish Environmental Protection Agency: "National Report on Environmental policies and relevant legislation". February 1996 (16 pages).
9. Swedish Environmental Protection Agency: "Environmental taxes in Sweden – economic instruments of environmental policy". Report No. 4745, 1997 (134 pages).
10. Stockholm Water Company: "Charges – Water and sewage in Stockholm and Huddings from 1 September 2000" (8 pages).

11. EBRD. A letter (e-mail) from Mr. Peter Carter (1 page).
12. "Reforming energy prices for sustainable energy development (Discussion paper by the ECE Secretariat)"; ENERGY/2001/6 and CEP/2001/11, 3 September 2001 (14 pages).
13. "Pricing of natural resources and environmental policies in the countries in transition to a market economy"; ENWA/WG.2/R.21 and EC.AD/WG.1/R.21, 30 November 1993 (16 pages).
14. EEB: "Water Pricing in the EU. A Review", by Eva Roth, January 2001. Publication Number 2001/002 (31 pages).
15. Commission of the European Communities: "Communication from the Commission to the Council, the European Parliament and the Economic and Social Council. Pricing policies for enhancing the sustainability of water resources". Brussels, 26.07.2000, COM(2000) 477 final (24 pages).
16. European Parliament: "Report on the Commission communication to the Council, the European Parliament and the Economic and Social Committee on pricing policies for enhancing the sustainability of water resources" (COM(2000)477 – CS-0634/2000-2000/2298(COS)). Committee on the Environment, Public Health and Consumer Policy. Rapporteur: Marialiese Fleming. Final A5-034/2001, 11 October 2001 (28 pages).

Additional documents and publication

17. OECD. The Price of Water. Trends in OECD countries. OECD Paris 1999.
18. Water pricing in selected Accession Countries to the European Union, current policies and trends. A report produced for the European Commission – DG Environment 2000.
19. Water for 21 Century. Vision to Action. Central and Eastern Europe 2000 (ISBN 91-630-9207-7).
20. International Statistical Yearbook 2000. Central Statistical Office. Warsaw 2000.
21. Environment 2001. Central Statistical Office. Warsaw 2001.
22. International Water Services Association. International Statistics for Water Services. Published for the IWSA Congress 1999. Buenos Aires. Argentina.

23. BGW. Entwiklung der öffentlichen Wasserversorgung 1990-1995.
24. Globus, statistische Angaben. Bundesverband der deutschen Gas- und Wasserwirtschaft (KA – Wasserwirtschaft, Abwasser, Abfall 2002(49), No.2).
25. Sewerage Charges in Europe. 26/27 October 1999 in Berlin.
26. European Commission. Waste-Water Charge Schemes in the European Union. Brussels, Luxembourg 1995.
27. Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. Official Journal of The European Communities. L 327, Volume 43, 23 December 2000. p.1-73.
28. Information from Questionnaires received from Finland, Lithuania and Sweden.
29. EBRD. Mr. Chris Shugart. Brief answers to questions posed by professor Marek Roman (First draft-subject to change – 12 June 2002).

Documents containing remarks referred to Draft Report

30. Remarks given by Mr. Claus Hagebro from HELCOM Commission.
31. Remarks given by Mr. Christian Ammitsøe from Danish Environmental Agency.
32. Remarks given by Mr. Inesis Kiskis from World Bank, Lithuania.
33. Remarks given by Mrs. Monika Stankiewicz from Polish Secretariat for the Helsinki Convention (Poland, Gdansk).
34. Remarks given by Mr. Stig Norstöm from the Swedish Environmental Protection Agency.