

Water Pricing and Policy in Estonia

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General

Estonian environmental policy as well as water management policy is guided by the National Environmental Strategy and the National Environmental Action Plan (NEAP) where the main policy goals and action plans to achieve the goals are formulated. The main principles of the NEAP are provided in Annex I to this report.

Water management responsibilities on national, regional and local level are under jurisdiction of the Ministry of the Environment, the Ministry of Social Affairs and the Ministry of Internal Affairs. This complicated water management structure will be re-organized taking into account river basin principle and potential public/private partnership possibilities.

Main players in Estonian water management system under the Ministry of Environment are:

1. The Ministry of Environment
2. Local environmental departments
3. Information Center of the Ministry of Environment
4. Environmental Inspectorate
5. Environmental Investment Center

Main responsibilities on environmental issues are on the Ministry of Environment. MoE is the coordinator of environmental protection and sustainable use of resources. The ministry has 4 higher units to organize the work: 1) Environmental administration, 2) Environmental management, 3) International cooperation and 4) Nature conservation and forestry. The unit of environmental administration has three departments which are dealing with financial, legal and administrative issues. Environmental management unit includes water department, waste department and environmental management and technology department. The international co-operation unit has the responsibilities in international cooperation, strategy and planning, and on fishery. The Nature conservation and forestry unit deals with forestry, both private and public forests and nature, including birds and habitats protection.

Water department of the Ministry of Environment deals with all water related issues: water protection and use, pollution from different sources, water special or public use, water services, etc. The main tasks are to co-ordinate and develop instruments for water management. Preparation of the legislation needed is also part of the work. The tasks of water department are divided into the following spheres: surface and drinking water, groundwater, dangerous substances, agriculture and agricultural water use and protection, wastewater, sludge, water protection projects and project supervision and development, legal questions and legislation.

The structure of the Ministry was changed at the beginning of 2000, and the most important change was that the county environmental departments were restructured and became environmental services directly under the Ministry of Environment. In every environmental service there are officers for different fields of environmental issues. The number of officers working in different fields depends mostly on the environmental situation in that county. The main tasks for water officers in service are: issuing and revoking of permits for special use of water, reporting on use of water resources and pollution charges, taking control samples from water bodies and from discharges, etc.

Environment Information Center (EEIC) collects, processes and issues environmental data, co-ordinates environmental monitoring program, prepares draft legislation, compiles activity reports etc.

The main tasks of Environmental Inspectorate include carrying out the work related to environmental supervision. This authority has to monitor as well as control that all the goals established by laws and regulations are followed and to ensure that the benefits that come from laws and regulations are also achieved. The Environmental Inspectorate is divided into regional departments. Currently the main

fields of actions for inspectorate are forest protection and water protection, since these two are the ones with the most problematic conditions.

The Environmental Investment Center is a non-profit organization which works in co-operation with the Ministry of Environment. Its main task is to elaborate and supervise environmental projects. The EIC is also financing environmental projects. The budget of EIC is formed from the state budget which in turn receives funds also from environmental taxes and charges.

Private companies and consultants constitute one more important player of the water management system. Private companies or consultants are usually hired for a single contract to carry out or to perform any specific work or task for the Ministry of Environment. Quite often they are involved also in producing legal acts or regulations which tasks and principles are approved and ordered by the Ministry of Environment,

Water use (abstraction and discharge) in Estonia is regulated by the water consumption permits issued by local environmental protection departments for 5 years as a maximum. Also the pollution charges are based on the permit's conditions. In spite of quite good regulation in that area, further improvements are necessary, particularly in enforcement and information exchange issues. According to the integrated pollution prevention and control approach, integrated environmental permits will be introduced which allow focusing on pollution sources and clean technologies, i.e. pollution prevention.¹

Legislation

Water related legislation covers about 20 legal act and regulations that are directly regulating the water protection and use. The most important of them is the Water act, which was first published in 1994. After that there have been changes and additions made to the Water Act almost every year. The Water Act states the main principles for water protection and for sustainable use of water resources:

- All the groundwater is state-owned
- Surface waters and other water bodies can be either a private or public property, depending on the case and conditions for what this water body is used or needed for or on its ecological status.
- Water use can be either public or special. In case of special water use the permit for special use of water (water permit) is needed. Water permit is needed if water is extracted from groundwater layers. or abstracted for the purposes of supplying drinking water, also when mining from the water body or when influencing the natural condition of a water body in any other way.
- Water could be used for industrial or domestic purposes. Depending on that, strict water quality requirements are established.
- Also the main principles and obligations for water users and for water protection against the pollution are stated in the Water act.

In addition to the Water act there are some specific acts:

- 1) Shore and Coast Protection Act - restrictions and obligations for activities on shores and coasts of water body to protect and ensure the water quality and prevent the pollution.

¹ Source: 1. National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000

2. Water management in Estonia (manuscript report 2000)

- 2) Public Health Act - duties and requirements to guarantee the safety of water that is used or planned to be used as a drinking water or a drinking water source, together with the obligations for supervision.
- 3) Public Water Supply and Sewerage Act - to regulate co-operation between the water users, water companies and local governments.
- 4) Environmental Supervision Act - gives the basic tasks for the work that has to be done by the Environmental Inspectorate.
- 5) Pollution Charge Act - sets pollution charges for soil, air or water pollution as well as the ways to determine the pollution charge.
- 6) Environmental Monitoring Act - determines the procedures and types of monitoring that has to be performed on a state, county or municipality level.
- 7) Regulation on requirements for wastewater discharged into water body or soil - quality requirements for wastewater that is being discharged, also the ways how to determine sensitive areas.
- 8) Regulation on issuing and revocal of permits for special use of water - main instructions for environmental services that are responsible for issuing and revocation of water permits. Provides conditions which have to be considered when permits are issued, as well as the requirements for monitoring for the special user etc.
- 9) Regulation on Implementing the Drinking Water Standard - gives the obligations to drinking water suppliers to follow the requirements needed for producing safe and healthy drinking water.

In addition to that, local governments have also the right to issue regulations and other legal act that have the power within the borders of their county. Most common of these are specific regulations to regulate the water and wastewater services, waste collection services, and procedure to determine the water supplying and wastewater collection service providers.

Water protection and use program

The Water protection program, approved by the Minister of Environment, defines the main activities to achieve main goals for water protection and use.

The main goals for water protection and use in Estonia are:

- 1) Safe drinking water
- 2) Sufficient supply of good quality surface and groundwater
- 3) Prevention of water pollution
- 4) Rehabilitation of polluted water bodies
- 5) Sustainable water use

Main activities for achieving these goals:

- 1) Construction and renovation of drinking water treatment plants and water supply systems
- 2) Restoration of water bodies
- 3) Boring of groundwater wells
- 4) Closing down old groundwater wells
- 5) Construction and renovation of wastewater treatment plants and sewerage systems
- 6) Implementing restrictions for pollution sensitive areas
- 7) Water quality monitoring

Water services

The Public Water Supply and Sewerage Act is the main instrument to regulate the relations between the water user and the water company. The local governments have to establish the development plan for

public water supply and sewerage system which covers 12-year period. The public water supply and sewerage system can be either public or private property. The water company has to ensure sufficient provision of water supply and discharging of wastewater through water supply and sewerage systems. The price of water services includes charge for extraction of water and charge for discharging wastewater. The price is regulated by the local government.

OVERVIEW OF BASIC HYDRAULIC CONDITIONS: number of river basins; quality indicators.

In Estonia 1755 rivers, streams, ditches and other such a flowing water bodies with their basins have been counted.

Estonia has no water shortage problems as the annual precipitation exceeds evaporation by 30%. The total volume of freshwater available per capita (8600 m³) is on the medium level in Europe. During the last decade the water consumption has decreased (37% in 1991-1994), but has stabilized currently, amounting 1403 million m³ in 1998. To control the water use, further measures, both regulating and investments should be followed. For economical water use transparency in water prices, full cost recovery and quantity measurement are essential as well as significant reduction of leakages.

Estonia has local water quality problems due to past pollution, intensive land use or natural peculiarities. Taking into account the present situation, there is an acute need to complete the inventory of past pollution and to follow with practical remediation projects. To ensure the “good” water status level stricter rules for sensitive areas and vulnerable zones are to be followed, and integrated water management action programs according to the catchment area principle elaborated.

Water abstraction and use

The total volume of freshwater available per capita is about 8000 m³ in Estonia, which is on a medium level in Europe. Water is abstracted for different purposes: public supply, industrial production, cooling water for energy production, agricultural activities and mining activities. It is abstracted from rivers and lakes, from different groundwater levels and partly from the sea. The level of water abstraction and consumption has changed in recent years, The decrease of production caused a decrease in water use. Higher water prices and more accurate measurement of water usage influenced the industry and the population to save water. Water was saved also due to decrease in water consumption and pollution charge. Most of the abstracted water, about 80%, is used as cooling water in thermal power plants in North-east Estonia. Because of sufficient water resources in the Narva River, which is used for cooling purposes, it is not necessary to recycle water in the cooling processes of energy production. Pumping out groundwater in mining industry in North-east Estonia is a serious problem of groundwater losses. Depending on climate conditions (during wet periods, three to 10 times as much water is pumped out from mines during droughts) every year 60-80% total abstracted groundwater is mine drainage water.

In Estonia water abstraction per capita was 1155 m³ in 1998. Excluding water from mines. water for energy production and fish farming, the figure is about 10 times less, 110 m³ in per capita in 1998.

The drinking water supply is based on: groundwater (65% of the inhabitants, in all rural settlements and most of towns) and surface water (35% of the inhabitants, in two large towns, Tallinn and Narva). Groundwater forms 15-20 % of the total water abstraction of Estonia. Groundwater aquifers are mainly in the Devonian, Ordovician, Cambrian and Vendian bedrock. For drinking water purposes the most important aquifers is the Cambrian-Vendian aquifer. In Estonia there are 1300 bored wells connected to the central water supply system for domestic use, 250 wells need to be reconstructed, and 100 should be tamped. In the cities the number of operational wells in 1997 was 890, and in 1998 it was 876, water consumption per day was respectively 164306 m³ and 141824 m³.

Tallinn gets about 80% of water from surface water resources. Lake Ülemiste has supplied Tallinn with water since 14th century. For the present the surface water supplying system begins in Central Estonia from upstream of the river Pärnu and includes catchment areas of the watersheds of the Jägala, Pirita

and Soodla rivers with the total area of approximately 2000 sq km. After the treatment in Tallinn Water Treatment Plant water is transferred to the water network, which length is about 800 km. There are 1500-1600 water supply network breakdowns every year. Mean age of the pipes is about 30 years, from which 18 % are older than 60 years. The oldest ones are from 1880-s. 25 % of the pipes need reconstruction immediately².

The use of water for domestic and industrial purposes has formed 4-5% of the total water consumption, respectively 0.3-1.2% of the consumed water has been used in agriculture, 6-7% in fish farming (mostly the sea water).³

In 1998 it was:

Urban:	Domestic use of water	61 million m3 (water use in towns)
Rural:	Agriculture and irrigation	5.5 million m3 (including domestic and industrial water use in rural areas)
Total	water use in the whole economy	1 403.1 million m3
	Total water extraction (water taken in total from different water sources, i.e. surface water (rivers, lakes), groundwater, seawater)	1 667.8 million m3 (the difference comes mainly from unconsumed mine drainage water in Ida-Virumaa County)
	Total water discharge (into water and soil)	1 670.5 millions m3

The difference between water extraction and discharge is because of combined sewerage system for storm and wastewater.

Length of the water supply network in Estonia is about 3100 km, from which 25 % is located in Tallinn. The pipes materials are steel and cast iron and need reconstruction⁴

Estonian water resources in general are not limited. In water protection river basins have been observed in Estonia for a long time. For complying with the Water Framework Directive Estonia will be divided into 6 basin areas (water management areas) and 8 sub-areas. The 6 basin areas are chosen because they are of an optimum size. Having in mind the size of Estonia, it is possible to distinguish these 6 areas based on water bodies and water management problems. They are related to coastal sea and it is better to handle coastal sea and river water protection problems together. The six area borders fit quite well in economical geography borders, in the 6 areas there are administrative regional centers and in these regional centers multifunctional environmental institutions are located. County Councils under the Ministry of Environment will be the competent authorities to administrate.⁵

² Source: Groundwater regime and consumption at water intakes with proved reserves. Geological Survey of Estonia 1998, Tallinn
National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000.

³ Source: 1. communication with Mrs. Maaja Narusk from the Environment Information Centre
2. Environment 1999. Yearbook. Statistical Office of Estonia 2000

⁴ Source: Yearbook "Regional Statistics of Estonia 1998" Statistical Office of Estonia Tallinn 1999; also communication with experts from the Environmental Information Center, Estonia
Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000.

⁵ Sources: Official list of rivers, streams and ditches in Estonia. Water Management Inspectorate at the Ministries Council. Tallinn 1986.

Household water pricing

Population

For the 1st of January 1999 the total number of inhabitants in Estonia was 1 445 580; 445 997 (30.85%) rural inhabitants and 999 583 (69.15%) urban inhabitants⁶

Domestic water consumption as a proportion of: Total Public Water Supply (PWS), %

There is no statistics in Estonia which shows the share of domestic use of water as a proportion of total public water supply. Special study would be needed for that, i.e. analysis of permits of special use of water would need to be carried out. Since the centralized water supply system exists for 80-95% of the population of larger settlements (Tallinn, Narva), and the largest industries are located in the larger settlements which use the same water supply system, one could say that roughly half of the water supply system is supplying water to the domestic sector, and half of the system - to the industrial sector. In 1999 water use in the domestic sector was 53.3 million cubic meters, and in industry it was 51.7 million cubic meters.

Domestic water consumption as a proportion of: Total water supplied to the system of Public Water Supply (%)

Due to the poor state of the water supply systems leakage is relatively high, in some places (North-east Estonia) up to 60 %. Lack of statistical information makes it impossible to estimate the expected share of domestic water consumption.

Share of population with access to Public Water Supply

Approximately 77% of the population is connected to the central water supply systems in Estonia. Surface water is purified and disinfected before use. Groundwater is usually used without treatment. In Estonia there are 23 water treatment plants, the most part of which operate insufficiently, i.e. they do not meet the standards set for wastewater treatment plants. In the bigger settlements 80-95% of population is connected to the centralized water supply systems.⁷

Most densely populated counties in Estonia are Harjumaa, Ida-Virumaa and Tartumaa where population density is 51-125 inhabitants per 1 sq km. Population density of 19-50 inhabitants per 1 sq km is observed in Lääne-Virumaa, Pärnumaa, Valgamaa and Võrumaa. Central Estonia counties Järvamaa, Jõgevamaa and Viljandimaa are scarcely populated, 16-18 inhabitants per 1 sq km. Population density of 12-15 inhabitants per 1 sq km is observed in counties on islands Saaremaa and Hiiumaa, and in Läänemaa and Raplamaa.⁸

On the 1st January 1999 535 131 inhabitants lived in Harjumaa county, 411 594 of them lived in the capital, Tallinn. Rural population in the county amounted to 79 738. In Ida-Virumaa urban population equaled 173 377, and rural population 22 083. Most of the Ida-Virumaa population lived in the two largest cities, Narva with 73 831 and Kohtla-Järve with 66 542 inhabitants. 2/3 of the inhabitants in Tartumaa are concentrated in Tartu, the second largest town in Estonia. 100 577 out of 151 010 lives in

National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000. Arvo Järvet 1999 "Water management and watershed principle" Environmental Technology 4/99, also <http://www.keskkonnatehnika.ee>

⁶ Source: Yearbook "Regional Statistics of Estonia 1998" Statistical Office of Estonia Tallinn 1999

⁷ Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000

⁸ Source: Statistical yearbook of Estonia 1998. Statistical Office of Estonia. 1998 Tallinn

Tartu. Rural population in Tartumaa is 42 765. There is an obvious link between population density and percentage of households connected to the water supply system. Cities with residential areas especially with block-houses with very high density of population have higher percentage of connection than smaller cities with residential areas consisting of small houses and having in some cases private wells. In rural areas in most cases every household has its own well.⁹

Metering penetration in households connected to the PWS

Water sold from PWS should be measured with water meters if PWS company and the client have not agreed any other way. Discharged wastewater is measured according to PWS and sewerage usage rules.

According to the National Environmental Action Plan (NEAP), water meters for public water supply consumers will be installed during 1998-2000. Public Water Supply and Sewerage Act (from 10.02.1999), clause 15, says that water sold to a client from a PWS shall be measured by a water meter installed by the water supply facilities of the registered property unless the water provider and the client agree otherwise. The financial responsibility for installation of meters in apartments is on the population.

More than 50% of inhabitants in the whole country and approximately 70% of inhabitants in Tallinn had water meters in 1999.

27 water companies belonging to the Estonian Water Works association have water meters installation in process. 8 companies have already finished this process. 50% of finances needed for this process is covered for the time being. According to the experts from the Water Works Association, every user will have water meters in the nearest months.¹⁰

Share of population with access to sewerage and public treatment facilities

In 1997 60 settlements (settlements with more than 2000 inhabitants and in total 1 170 428 inhabitants) had on average 69.8% of population with access to sewerage. Almost all of the settlements (with exception of only a few settlements) have sewerage with treatment, but in most of the cases wastewater treatment systems are under renovation or they need reconstruction. Among the 60 settlements the largest towns of Estonia had the rate of population access to sewerage as follows:

Tallinn (420 470 in.)	95%
Tartu (98 400 in.)	94%
Narva (79 000 in.)	92%
Pärnu (51 000 in.)	61%

In 1999 on average in 30 towns (in total 898 423 in.) in Estonia from total figure of access to sewerage, 64.1 % is access for population and 35.9% for enterprises. At the same time, connection to PWS on average is in the same 30 towns 74.7% for inhabitants and 25.3% for enterprises.¹¹

⁹ Source: Yearbook "Regional Statistics of Estonia 1998" Statistical Office of Estonia Tallinn 1999

¹⁰ Sources: 1. Water meters installation to public water supply users 1998-1999. Estonian Water Works Association.;

Sourcebook on Economic Instruments for Environmental Policy REC, 1999

Act on Water Supply and Sewerage Network (from 10.02.1999)

¹¹ Source: Association of Water Companies 1.07.1999

Access to sewerage in counties in 1998

County	Population in 1 January 1999	Urban	Rural	Inhabitants with access to sewerage	%
Harjumaa	535 131	455 393	79 738	468 000	87
Ida-Virumaa	195 460	173 377	22 083	170 000	86
Tartumaa	151 010	108 245	42 765	109 000	72
Läänemaa	31 850	15 302	16 548	17 000	52
Lääne-Virumaa	75 819	35 689	40 130	39 000	52
Viljandimaa	62 336	30 027	32 309	31 000	49
Pärnumaa	100 100	64 880	35 220	49 000	48
Järvamaa	43 144	17 398	25 746	18 000	42
Saaremaa	40 111	16 364	23 747	16 000	39
Võrumaa	43 029	17 582	25 447	17 000	38
Raplamaa	40 137	15 518	24 619	15 000	38
Jõgevamaa	41 377	13 534	27 843	15 000	37
Valgamaa	38 668	21 684	16 984	14 000	36
Hiiumaa	11 798	4 279	7 519	4 000	36
Põlvamaa	35 610	10 311	25 299	12 000	33
Total	1 445 580	999 583	445 997	994 000	69

Source.- Review of Wastewater treatment systems in 1998 based on report of Water Usage. Narusk and Ristok 1999. Ministry of the Environment of Estonia, Environment Information Center, Tallinn

Discharge of wastewater, million m³/y

	1993	1994	1995	1996	1997
Total discharge of wastewater	2063	1962	1849	1692	1686
Water, not requiring treatment	1667	1582	1452	1375	1337
Water, requiring treatment	393	378	396	316	349
Not treated	23	19	18	15	10
Treated	370	359	378	301	339
Mechanically	188	186	203	138	184
Biologically	86	87	89	85	82
Mech-chemically	82	1	1	1	1
Biol.-chemically	13	841	85	77	72

Source.- Estonian Environment 1997. Ministry of the Environment of Estonia, Environment Information Center, Tallinn 1999

Wastewater of Tallinn is submitted to biological-chemical treatment plant via a deep-sea outlet into the Gulf of Finland. The Tallinn wastewater treatment plant is one of the most modern ones in Europe. At the moment construction works for sludge disposal and N removal are proceeding.¹²

¹² Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000

Households water consumption

Domestic use of water / number of inhabitants = consumption of water per capita:

Year	Domestic use of water, million m ³	Population	Use of water per capita, m ³	Use of water per capita l/day/person
1998	61	1 453 800	41.96	115,0
1997	76	1 462 130	51.98	142,4
1996	87	1 476 301	58.93	161,5
1995	88	1 491 583	58.98	161,6
1994	92	1 506 927	61.05	167,3

Source: Statistical yearbooks 1994-1998. Statistical Office of Estonia. Tallinn

Household tariff structures

In Estonia local government establishes rates for water, wastewater as well as the price for connection to PWS. For example, in town of Rapla (6320 inhabitants) the connection price for small consumers is 1865EEK+VAT 18% (20m³/y) to 13984EEK+VAT 18% (150m³/y). Formula to calculate the price in the mentioned town Rapla is as follows: $L=G(T_v+T_k)K$, where L is connection price without VAT in EEK, G is 1 annual need for water per person in m³/y, T_v is a price for water, T_k is price for wastewater, and K is participation coefficient which depends on the need for water during one year. However, if the site or house is too far from the main collector, there is no need to pay the fixed connection price based on the consumption need, but all the costs related to connection of the building to the main collector should be covered.

In Tallinn the connection price is very different in different cases, depending on the size of the house, the size of the site, soil, building prices and distance to the network. Tallinn Water Company said that the price might range from 0 to several 100 000 EEK. PWS company guarantees water supply and discharge and treatment of wastewater. Local government is choosing the PWS enterprise through the according competition among the PWS companies. Service of water supply and discharge of wastewater is sold based on an agreement between a customer (water user) and PWS company.

Two kinds of water tariffs exist in Estonia - flat for inhabitants without water meters and uniform volumetric for those having water meters.

According to Public Water Supply and Sewerage Act the price of the service of supplying water and collection/treatment of wastewater shall cover production costs. Water supplied shall comply with quality and safety requirements, as well as environmental protection requirements. Service shall operate with justified profitability.

In Tallinn, tariff for water services (water + wastewater + VAT) for inhabitants is 15 EEK/m³. In case if there is no water meter, the price is calculated based on the calculated water use per day per 1 person, which might depend on water sources etc. and ranges from 30 to 300 litres per day.

Water company charges enterprises administrating a house without water meter for water and wastewater monthly based on water consumption norms and based on water amount calculated for number of people registered in the house.

Taxes and levies on household water tariffs

VAT – 18%¹³

Water permit for special use is needed:

- 1) if water extraction from surface water body or ice is more than 30 m³ per day
- 2) if water extraction from groundwater is more than 5 m³ per day
- 3) in case of discharging wastewater or any other polluting substance to water body

More than 1200 water permits have been issued to enterprises. RED (local agency of Ministry of Environment) is responsible for the process of permitting. In case of large users it is the national level (Ministry of Environment). Environmental impact assessment or expertise might be required. The permit is valid usually for 5 years but it might be shorter if water supply or sewerage changes are predicted or because of water protection reasons. Every year the enterprises should fill out the statistic forms “Water Usage” for Water Register and Statistical Office of Estonia (state statistical report, regulation of finance minister nr.89, from 18.11.1999). The forms contain the following information.

Information on water extraction (groundwater, PWS or water body) and use (domestic, industrial, energy) in m³/y, water discharge and pollution loads (BOD₇, suspended solids, N_{tot}, P_{tot}, oil), wastewater treatment system (name, type, bio ponds, capacity, number of people served and important industries, status etc) is provided in the permit.

Water prices in special use of water (more than 30 m³ per day from water body and more than 5 m³ of groundwater) are set by government regulation No. 227 from 7.10.1998.

¹³ Source: Water Act (from 11.05.1994)

Source: Ministry of Environment of Estonia, Environment Information Centre, Water Register

Household tariffs

Act on Water Supply and Sewerage Network (from 10.02.1999) and local government rules regulate the water price establishment in place. This act says that the local government establishes the prices. The influence of the operator on the prices depends on finding good loans or investments, which gives better possibilities to the water company. The main investments for reconstruction works, for example, come through the state or municipal level projects. If there are no loans or investments, then consumers pay all the reconstruction costs. Generally, the water price is established in co-operation between the local government and the water company.

Public Water Supply and Sewerage Act clause 14.3 on price for water supply and wastewater discharge service shall be established such that the water undertaking can 1) cover production costs, 2) comply with quality and safety requirements, 3) comply with environmental protection requirements, 4) operate with justified profitability. The price shall not be discriminatory with regard to different clients or groups of clients. The price shall be established by the rural municipality or city government and made public at least three months prior to making changes thereto.

A public water supply and sewerage system shall be constructed on the basis of the public water supply and sewerage system development plan approved by the local government council. A water undertaking shall be appointed according to the decision of the local government council.

Average water price for Estonia is calculated here as sum of water prices in different companies divided by the number of companies. Average prices have increased during the last 5 years in Estonia 3.2 times.

Average prices in Estonia

Date	Average prices (EEK)
01.07.99	15,00
01.01.99	14,50
01.07.98	14,30
01.01.98	12,80
01.07.97	11,80
01.01.97	9,40
01.01.96	7,80
01.09.94	4,70

Average prices in largest cities: in Tallinn they increased 3.6 times over the last 5 years, in Tartu 5.4 times, in Narva 9.5 times, in Pärnu 2.27 times, in Viljandi 3 times.¹⁴

Ownership of the infrastructure and management

There are 31 PWS companies (Ltd.) belonging to the Association of Water Works (established in 1995) giving water services to more than 30 bigger settlements. These enterprises are mostly under privatization process from former municipal institutions and are operating now in co-operation with local government. In several places (bigger cities) foreign companies are interested in the privatization. In smaller municipalities local companies are more interested.

¹⁴ Source: Association of Water Companies, 1999

Collection efficiency: There is no statistics about the collection rate. It seems there are no major problems with the collection efficiency. For example, one company indicated that last year there was only 0.5% of the total amount of the charges that they had to calculate as costs. It might be different, however, in different cities. In Tallinn, for example, there was a very good instrument to make the clients to pay - a possibility to close off water if the user does not pay. At the moment the instrument is not allowed. It could change because there is new municipality council now.

Average water charges as a proportion of households' incomes or expenditures

In 1998 the disposable income per household member was 22 673 EEK, the highest income source was income from labour - 14 468 EEK (64%). The expenditure per household member was 22 372 EEK, of which more than one third (34%) was spent on food, 18% on dwelling, 7% on clothing and footwear, 7% on leisure time, 7% on transport, and 5% on miscellaneous goods and services.¹⁵

January-December 1998 average net income per household member per month was 1889.4 EEK (in Tallinn 2 531).

In 1998 1 person consumed 41.96 i.e. 42 m³ of water and in 01.01.1999 average price for water was 14.5 EEK/l m³ (see previous tables). 1 person had to pay in 1998 in total around 609 EEK, and 50.75 EEK per month which makes 2.68% of income per month. Since 1.07.1999 he had to pay already 630 EEK. During the 6th month (1.01.1999-1.07.1999 prices increased 1.03 times). The level of average monthly gross wages in 1998 was 4125 EEK (in Tallinn 4979 EEK it was the highest and in Võru county 3022 EEK the lowest).

Recovered costs

According to the National Environmental Action Plan (NEAP), preparation of regulations for local governments relating to water supply and sewer systems, including development of corresponding guidelines is based on local budgets, licensing of companies providing water supply and sewage services is based mostly on state budget, preparation of development plans for water supply and sewer systems within local government areas (including the development of corresponding guidelines) is expected to be financed by local budget, creation and funding of Water Supply and Sewer Systems Committee by state budget etc.

The level of the recovered costs is different in different cities. For example in Haapsalu the new wastewater treatment system is constructed and now there is one of the highest water price in Estonia. Recovery of costs depends a lot on how local government or municipality is able to find investments and what is the technical shape of supply system and sewerage, how much investments and reconstruction are needed. Because the prices for industry are 2-3 time higher, cross-sector subsidizing exists. Also direct transfers from municipality to the operators are in place. A lot of renovations are still needed, which means that additional money is needed (for example 1 m of water pipes building costs 1000 EEK and wastewater pipe building costs 2000 EEK). Tallinn Water Company took a loan from EBRD and therefore also prices increase in order to pay the loan back.¹⁶

On-going reforms

Bearing in mind the Estonian main target to join the EU in 2003, several legislative, technical and institutional gaps have been discovered in comparison to the EU directives. Amendments in legislation are essential to ensure the water protection and rational use corresponding to the requirements of EU and international conventions. Special attention should be focused on investment projects in water

¹⁵ Source: Yearbook "Regional Statistics of Estonia 1998" Statistical Office of Estonia Tallinn 1999

¹⁶ Source: <http://www.envir.ee/eng/index.html>

management, monitoring, improvement of laboratory capacity and additional training of personnel in this regard.¹⁷

A very important issue related to implementation of the Water Framework directive is to work out and implement the environmental objectives in order to protect and ensure good quality of all the waters concerned. Therefore, a regulation on water quality classes has been drafted and prepared to be presented for approval. Most of the efforts of the Ministry are focused on implementation of the requirements of EC water protection directives (Drinking water, Urban Wastewater Treatment, Nitrate directive, Directive on surface water intended for abstraction of drinking water, Groundwater, Dangerous Substances, Sludge used in agriculture, etc.).

Since all water-related directives as well as the water framework directive have very specific requirements on monitoring, water quality and storing the gathered information, a detailed analysis has been made by the Environmental Information Center on monitoring requirements. The analysis gives an overview of the existing system and proposals for establishing a new monitoring system for water quality observance.

The most serious change is to rearrange the current water management system, by implementing the River Basin Management principles. The result of several studies and researches is that it is proposed to divide the whole territory of Estonia into six independent river basin areas. The responsible administrative authority will be one of the county environmental services situated in that river basin area. The new Water act will be the legal base for formation of river basin districts and for establishing river basin management plans. Further changes, for example to ensure the administrative capability etc., are already planned to take place in the year 2001.

The technical gaps concern mostly reconstruction of water supply and sewerage systems - about 60% of these have depreciated causing leakage and pollution. The situation in wastewater treatment has improved (about 80 new plants have been built during 5-6 recent years). With respect to drinking water supplies, there is an urgent need for pre-treatment plants and pipelines reconstruction.

Many different water projects are being implemented in local governments and municipalities, for example the Estonian Small Municipalities Water and Wastewater EU Accession Project. In cooperation with the county authorities and scientists, the Ministry of Environment has worked out a plan addressing reconstruction and construction of small sewage treatment plants during 1997-2002.

PWS and sewerage system rates will increase in Estonia on average 15 - 20% per year, but the increase will slow down in time. Necessary investments for the systems reconstruction is estimated in total 8.1 billion EEK (includes all building costs). But the investment might be even higher depending on construction cost changes.

¹⁷ Sources: 1. National mapping and vision report on water resources management, Estonia. Global Water Partnership. Tallinn, 2000
2. Evaluation of necessary investments for water supply and sewerage development in urban settlements of Estonia for 1998 to 2010. Association of Water Works. Tallinn 1997

Industrial water pricing

Annual water consumption for industrial use¹⁸

1998	57 million m ³
1997	63 million m ³
1996	61 million m ³
1995	62 million m ³
1994	69 million m ³
1993	75 million m ³

In 1998 water consumption in industry amounted to 57.2 million m³, and in energy supply 1176.2 million m³.¹⁹

A major part of Estonian industry is based on the use of local natural resources. The most important branches of industry are food, metal and machine industry, wood, paper and furniture production, light industry, chemical, rubber and plastic industry, mining and production of building material. Water consumption in the industry has decreased since the early 1990-s. In 1998 the water consumption was more than twice less than in 1992 due to the economic crisis. Due to the economic changes in Estonia, enterprises with old and not sustainable technology have been closed or reorganized.²⁰

Sources of industrial water

There is no statistics focused on water sources in industry.²¹ Most industrial companies located in urban settlements are using public water supply systems, and those in rural settlements usually have their own wells or abstraction systems from surface water.

In Tallinn most of the water for industry is obtained from a city network. In connection with termination of the operations (Paper Factory) or reorganization of several enterprises (Soviet military factory Dvigatel and RET etc.) that consumed large amounts of water, as well as because of introduction of more sustainable technological processes (food processing industry), the demand for water has decreased about 60 % in the city during the period 1992-1998.

Sectoral water use

There is no statistics focused on water consumption in industry branches; specific study would need to be performed. However, some numbers on energy sector are available.²²

During the time period 1992 to 1998 water consuming in the energy sector has decreased due to lower energy production, which, according to Estonian Statistical Office, was caused by smaller export possibilities.

¹⁸ Source Estonian Environment 1997

¹⁹ Source: Yearbook "Regional Statistics of Estonia 1998" Statistical Office of Estonia Tallinn 1999

²⁰ Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000

²¹ Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000.

²² Source: National mapping and vision report on water resources management. Estonia. Global Water Partnership. Tallinn, 2000

Annex 1 NEAP Introduction and principles

On 12 March 1997 the Parliament of the Estonian Republic approved the National Environmental Strategy for Estonia (NES). The NES has set out ten priority goals for environmental policy and identified short, medium and long-term objectives/targets to be achieved by 2000, 2005 and 2010 respectively.

The ten priority goals are:

1. Stimulation of Environmental Awareness and environmentally friendly consumption patterns;
2. Promotion of Clean Technologies;
3. Reduction of environmental impacts of Energy Sector;
4. Improvement of Air Quality including reduction of transport emissions;
5. Improvement of Waste Management, reduction of waste generation, stimulation of recycling;
6. Clean-up of Past Pollution;
7. Sustainable Use of Groundwater Resources;
8. Surface Water Protection and rational use of water bodies;
9. Preservation of Landscape and Biodiversity;
10. Modification of Built Environment in line with human needs and environmental health requirements,

With a view to implementing the Strategy, a detailed National Environmental Action Plan (NEAP) was developed between April 1997 and April 1998. It was approved by the Estonian Government and the Ministry of Environment bears the responsibility for the NEAP implementation. The wider objective of the NEAP is to pave the road to further progress towards sustainable development by effective implementation of policy goals stipulated in the Estonian National Environmental Strategy. The NEAP project has been launched by the Ministry of Environment, assisted by the EU Phare Program and facilitated by WS Atkins & Associates which provided managerial support, methodological and technical expertise based on international experience.

The NEAP is characterized by the following features:

- Specific short- medium- and long-term actions supporting each policy goal generated by the stakeholders.
- Prioritization and short listing of actions through scoring and weighting system, economic analysis in a consensus building approach.
- Realistic assessment of financial and institutional constraints reflected in the Financial Plan.
- Indication of clear responsibilities and potential funding sources.
- Participation of the stakeholders and interest groups in defining the content of the NEAP and the feasibility and desirability of the actions, and deciding on the final selection of actions.

In the iterative process of generating and redrafting the actions by specially convened Working Groups and Reference Groups, the following principles (many of them related to sustainable development) were applied:

- Low cost actions bringing considerable environmental benefits such as good housekeeping and environmental management, environmental awareness raising, win-win actions (bringing economic and environmental benefits in the same time) should have priority over actions requiring significant capital expenditures

- Actions preventing environmental damage by addressing the causes at the earliest possible stage should have priority over actions addressing the on-going environmental impacts.
- Improvement of the existing production technology should have priority over introduction of high capital cost technology (if feasible).
- When introducing new technology, the BATNEEC principle should be applied (best available technology which does not entail excessive costs on industry and consumers).
- The polluter/user responsibility for covering the costs of prevention and minimization of pollution, and of remediation of environmental damage (the Polluter Pays Principle).
- Natural resources should be used efficiently. The use of non-renewable resources should be minimized and offset by use of renewable resources within their regeneration capacity.
- Actions should be implementable i.e. they should be realistic regarding the economic, institutional capacity and their implementation time-frame.
- Responsibility for pollution prevention and control should be integrated rather than spread among various institutions, and based on multimedia approach.

The NEAP should not be considered as a finished process or an exact document. It is a realistic reflection of the Estonian needs and expertise as of 1998, expressed by a large forum of individuals representing the government, local authorities, consultants, scientific community, industry, NGOs and others. It is a working paper which should be subject to continuous improvement through regular revisions to accommodate the rapidly changing Estonian priorities stemming from the fast-track socioeconomic transformation and the EU accession process. (*Source: <http://www.envir.ee/eng/index.html>*)