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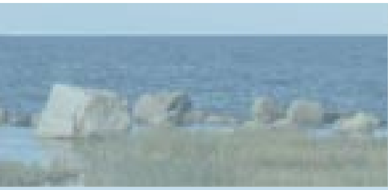


ENVIRONMENTAL REVIEW 2005: INDICATOR-BASED SUMMARY


ESTONIAN ENVIRONMENT
INFORMATION CENTRE

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ESTONIAN ENVIRONMENT INFORMATION CENTRE

Tallinn 2007

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Contents

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Introduction

The first issue of an indicator-based summary relying on "Environmental Review 2005" paves the way for a new series of publications by the Estonian Environment Information Centre. While the full version of "Environmental Review 2005" is mainly targeted at the public, the current summary aims primarily to draw the attention of environmentalists outside Estonia. This publication is a special one among previous Estonian environmental reviews, because for the first time we have tried to analyse the status of the environment in the light of national objectives. The Estonian Environmental Strategy, the national strategy "Sustainable Estonia 21", sectoral strategies and action plans, EU legislation and international conventions are the documents which provide objectives for improving or maintaining the achieved environmental status. The environmental review reflects on environmental trends from 2000 (in some cases also from an earlier period) until 2004, depending on the issue.

This report contains a selection of data from the full report "Environmental Review 2005". The data that best corresponds to the Core Set of Indicators (CSI), worked out by the European Environment Agency, or other similar indicators, has been included in this summary. Among its other advantages, the indicators, e.g. CSI used by most EU countries, give an opportunity to compare changes in countries over time.

Compared to the other EU countries, the most significant differences in Estonia are a low per capita performance for air emissions, as well as low performance per GDP for energy consumption and greenhouse gas emissions. The main reasons for such differences are the oil-shale industry in Northeast Estonia, small population and low population density.

The most heated debate on the Estonian environment has long been discussion over oil-shale as our main energy resource and its alternatives. Estonia is a unique country whose energy production depends

primarily on the use of oil-shale. Renewable energy is produced by smaller hydroelectric power plants and wind parks on the coasts of West Estonia. Renewables formed about 10% of the primary energy supply in 2004, with wood fuel prevailing. Utilisation of firewood, wood waste and chips has been fairly constant compared to the year 2003.
Energy consumption per capita is relatively high due to climatic conditions and low population density, being somewhat similar to that of our Nordic neighbours. Energy intensity per unit of GDP is similar to the other (industrialised) EU-10 Member States.
Energy related activities are the most significant contributors to GHG emissions. Estonia reduced its greenhouse gas emissions about twice from the 1990s to the beginning of the current decade, mainly due to the reduction of industrial production. Nevertheless Estonia is among the countries that have the highest greenhouse gas emissions per capita in the world and in Europe.

Throughout the last decades the energy sector in Estonia has also been the biggest user of water and mineral resources as well as the biggest generator of waste.

On the other hand, Estonia has been coping well with achieving air emission targets, the main worries being the oil-shale power plants and the transport sector. Oil shale usage contributes about 65% of the total CO_2 emissions of Estonia. Estonia's Kyoto target is to reduce these by 8% by 2008–2012, against 1990. In order to reach the Kyoto target (34.2 million tons of CO_2) Estonia has to reduce the emissions of greenhouse gases by 2.973 million tons as of 2008. The proportion of emissions produced by oil shale power plants to other emissions such as carbon monoxide and volatile organic compounds is smaller and decreasing because of the rapidly increasing emissions from the transport sector. Emissions from non-industrial fuel combustion (households, agriculture, business and the public sector) have grown by 38.8% due to an increase of wood and wood waste combustion.

Waste management has progressed fast, especially in terms of recovery and separate collection of waste. Implementation of the Packaging Act and the Packaging Excise Duty Act have promoted the recovery of packaging and packaging waste, separate collection of waste and sorting of municipal waste by fractions in the new Tallinn waste sorting plant. In 1999–2003 the proportion of municipal waste deposited in landfills has decreased significantly and formed only 67% of the total amount of municipal waste generated in 2003. The recovery of municipal waste has increased by more than 10% from 1999 to 2003. The surveys on type-based composition of municipal waste in 2000 showed that the approximate percentage of packaging waste in the total mass of municipal waste was estimated at 25-30% in 2000. As at that time the collection by types was minimal, and this has increased over the years, the content of packaging waste in the mixed municipal waste decreased in 2003. According to estimates, in 2003 the percentage of packaging waste in mixed municipal waste was under 20%.

The full version of the report is available at www.keskkonnainfo.ee


Area of Estonia:
45,226 km²
Population:
1,347,510, 1 January 2005,
and 1,344,684, 1 January 2006
Population density:
31 inhabitants per km²

Sources and further information:

www.keskkonnainfo.ee

Estonia's Environment Strategy until 2010 – www.envir.ee

Sustainable Estonia 21 – www.envir.ee/166310

Environmental conventions in force in Estonia – www.envir.ee/58745

Related policy documents – http://eur-lex.europa.eu

Statistics Estonia – www.stat.ee

European Environment Agency – www.eea.europa.eu

Environment DG – http://ec.europa.eu/dgs/environment/index_en.htm

Estonian Energy 2004. Tallinn, Ministry of Economic Affairs and Communication, 2005.

The European Environment. State and Outlook 2005. Copenhagen, European Environment Agency, 2005.

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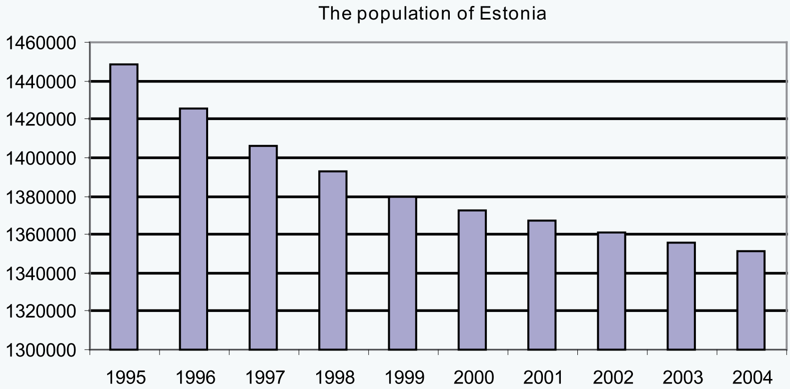
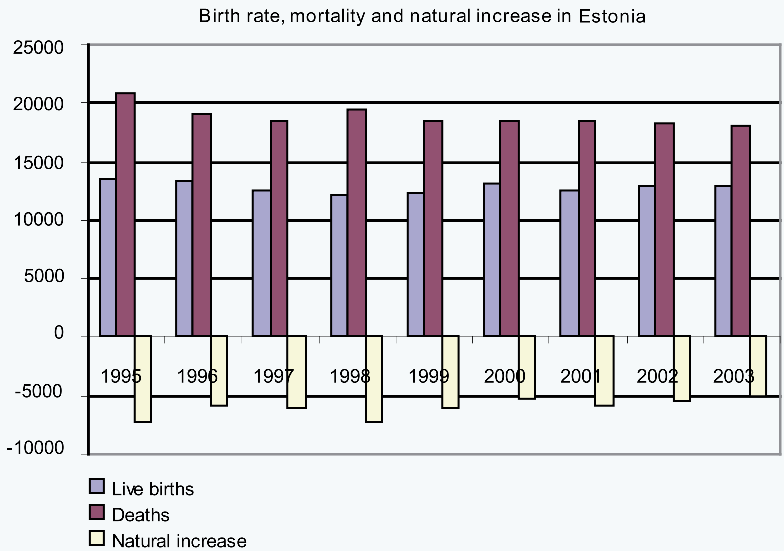
Moora, Harri. Pakendi ja pakendijäätmete kogumis- ja taaskasutussüsteemi rakendamine Eestis. Tallinn, SEI-Tallinn, 2003.

1 SOCIOECONOMIC DEVELOPMENT

1.1 POPULATION

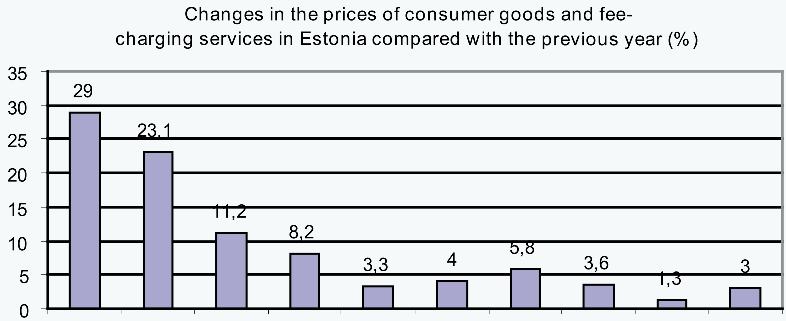
The population of Estonia increased by approximately 17% during 1970-1990, whereas the growth of urban population was 30%; this rapid increase was primarily conditioned by immigration. During the 1990s, the Estonian population has been at constant nadir, caused by minimal immigration and negative population growth.

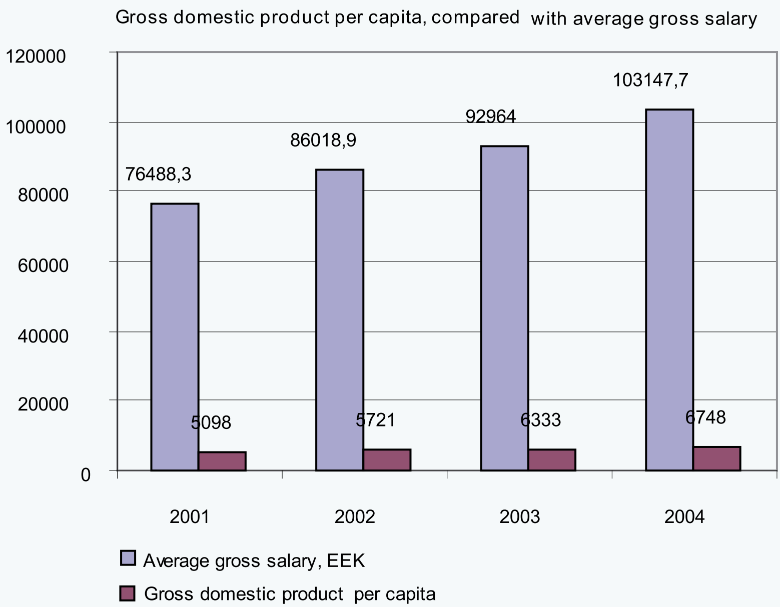




1.2 CONSUMER PRICE INDEX AND GDP

Changes in the prices of consumer goods and fee-charging services are best reflected by the consumer price index. In comparison with the mid-nineties, the recent changes in the consumer price index have been minimal, thus referring to a more stable and competitive economic environment.

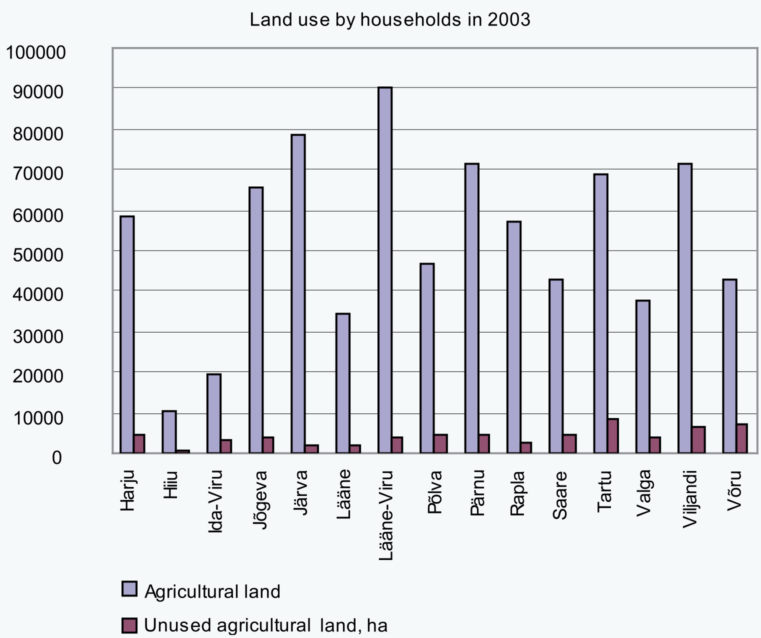




The gross domestic product (GDP) expresses the added value (in monetary terms – production from which intermediate consumption has been deducted) of the goods and services annually produced by the residents and non-residents within the economic territory of a country, in market prices. Intrinsically to a developing country, our GDP has been increasing in the course of years. Compared with 1995, the GDP has grown by nearly three times by the year 2003.

1.3 LAND USE

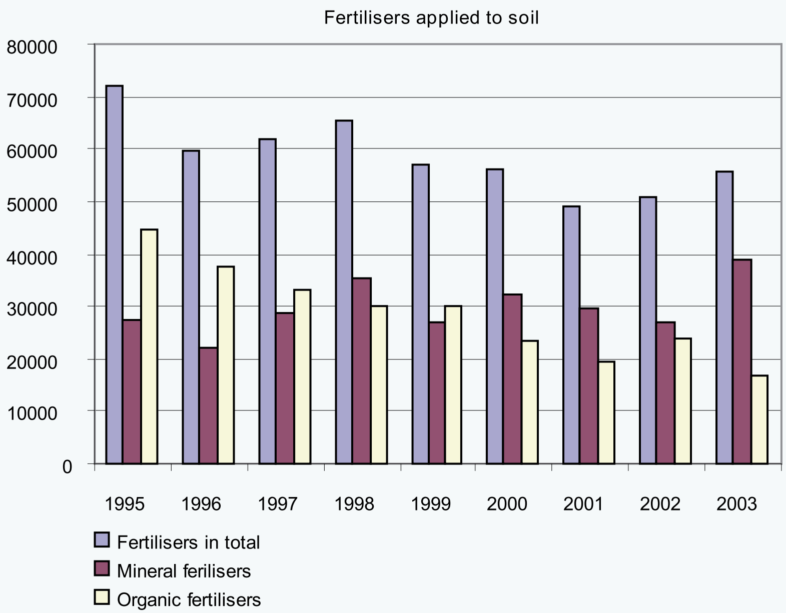
Differently from a number of European countries, the percentage of uninhabited areas in Estonia is relatively large and the population concentration small. In Estonia, the average number of people per square kilometre is slightly over thirty, whereas in Europe, this parameter is more than a hundred.



1.4 AGRICULTURE

If during the 1990s, organic fertilisers were used predominantly, then currently, the use of mineral fertilisers has become more popular. In comparison with 1995, the percentage of mineral fertilisers, applied to the soil in agriculture, has increased more than 40%, compared with organic ones. The use of fertilisers in general has reduced.

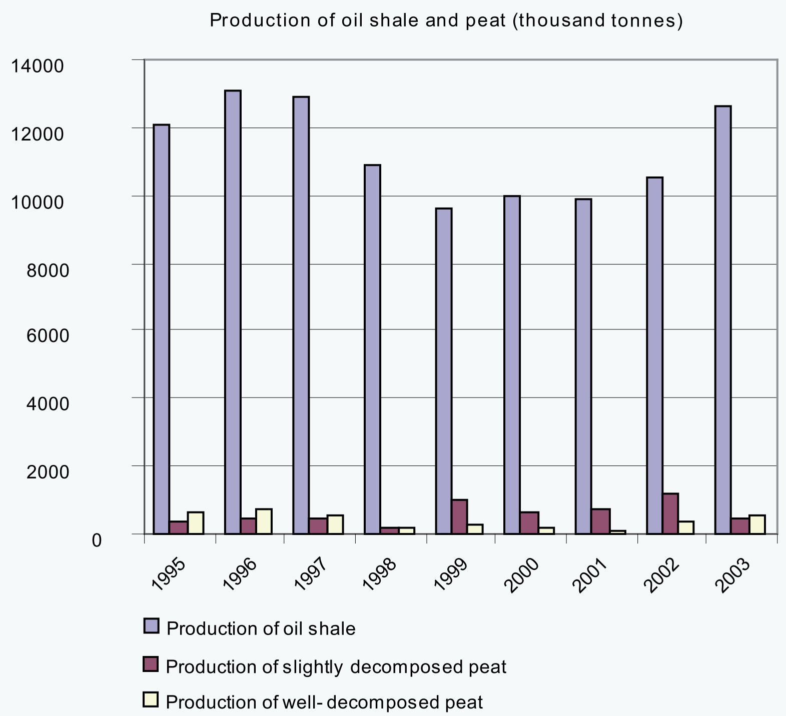
In total there were around 4000 ha of controlled agricultural land (0.4% of agricultural land in production) used for organic farming in 1999. In 2000 there were at least 238 farmers with about 10 000 ha, who had applied for the state label "Mahemärk". The marketing of organic products is weak and consumers have difficulties finding organic products in the shops. The most common marketing methods are on-farm sales, selling to hospitals, schools, kindergartens and local shops. Taking into account the present agricultural situation and existing developments, there is great potential for the rapid development of the sector. It is estimated that there will be a 50 to 100% annual increase of production over the next few years.



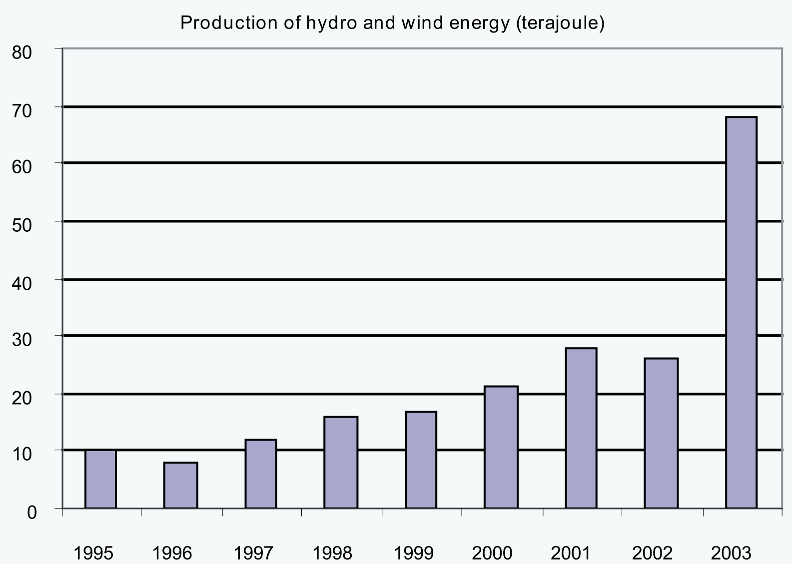
1.5 ENERGY

Extraction of mineral resources inevitably brings along certain environmental damage, we have to cope with this if we want to consume electricity produced in Estonia. Oil shale is the main source for the production of electricity in Estonia. At the end of the 1990s, oil shale production was declining, but as of 1999, it has been continuously increasing. The level of oil shale mining was the lowest in 1999, however, in 2003, oil shale was again produced in volumes comparable with the mid-1990s. Nevertheless, these figures could not be compared with the eighties, when e.g. in 1985, oil shale was mined in a quantity which more than twice exceeded the amount mined in 2003.

In connection with the development of technology and the increasing costliness of oil shale energy, the quantity of electricity, produced from renewable energy sources, has increased over the years. The national indicative target (12% of gross national energy consumption by 2010) has already been achieved due to the relatively high use of wood and wood waste for heat production, followed by biomass. In 2003 the share of renewable electricity stayed below 1% despite a 2.7 increase from 7 GWh in 2002 to 19 GWh in 2003, mostly of wind and small hydro. In December 2004 Estonian parliament approved the long-term public fuel and energy sector development plan until 2015. It foresees a 1.5% share of renewable electricity sources in 2005 and a national target of 5.1% for 2010.



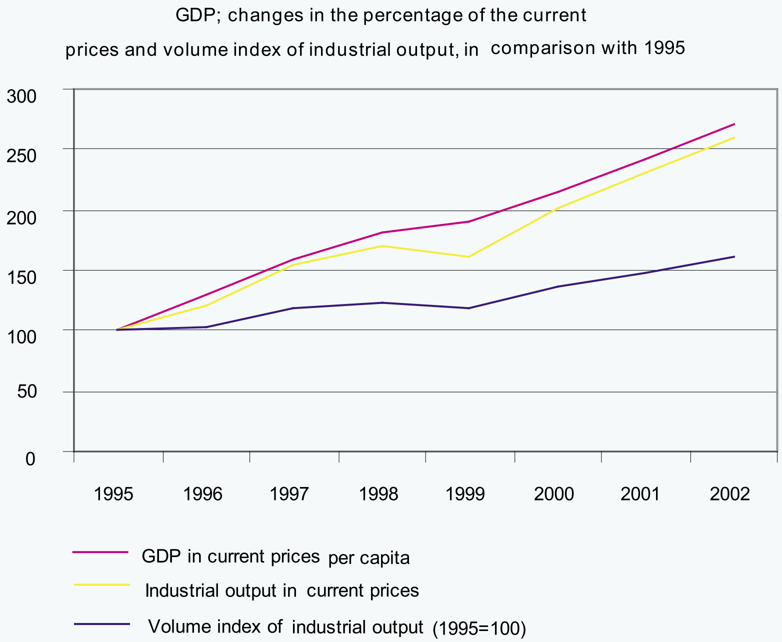
Production of oil shale and peat (thousand tonnes)
14000
12000
10000
8000
6000
4000
2000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
Production of oil shale
Production of slightly decomposed peat
Production of well- decomposed peat



Production of hydro and wind energy (terajoule)
80
70
60
50
40
30
20
10
0
1995
1996
1997
1998
1999
2000
2001
2002
2003

1.6 INDUSTRY

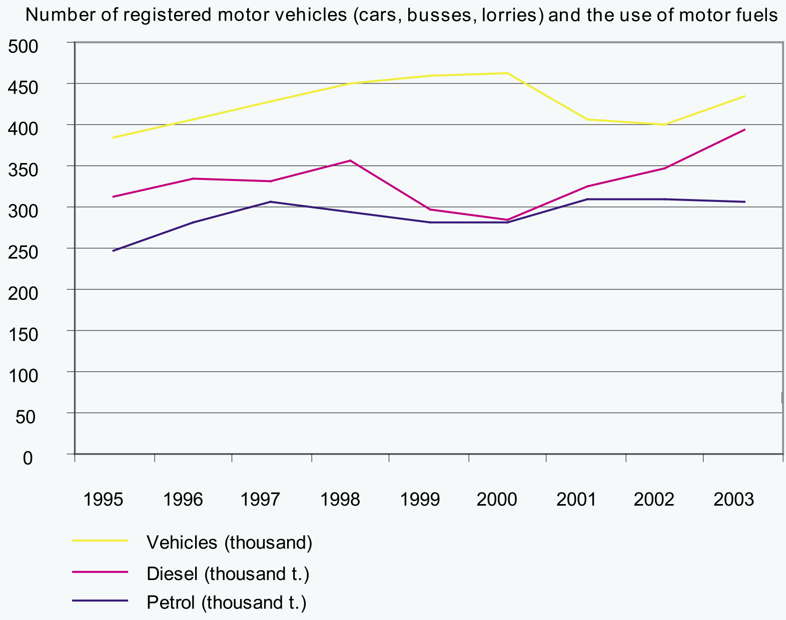
Similarly to the GDP, it is possible to observe a constant increase in the current prices and the volume index of industrial production. The growth, regarding the current prices and volume index of industrial output is a very positive phenomenon from the viewpoint of the well-being of the population. Yet, this frequently brings along more intensive use of natural resources.



1.7 TRANSPORT

As in the majority of large cities, air pollution has also become a problem in the cities of Estonia. In addition to boiler plants and factories, motor vehicles can be regarded as one of the major sources of pollution. There is a general growth in the number of vehicles, however, in 2001 and 2002, the quantity of vehicles seemed to decrease. This, however, is deceptive as these were the years for the issuance of new certificates of registration for motor vehicles and the vehicles for which such a document was not applied for, were deleted from the register.

Regarding motor vehicle fuels, the consumption of diesel fuel has been larger than that of petrol – this is a natural phenomenon as the majority of larger and more fuel-consuming vehicles indeed operate on diesel. At the same time, the growing proportion of diesel on the motor fuel market also refers to an increased price sensitivity by the consumer – in connection with the ever increasing petrol prices, numerous diesel vehicles have occurred on our roads, as the price of diesel is cheaper than that of petrol. It is not possible to anticipate a reduction in the number of motor vehicles in the future. Thus, the pressure on the environment, caused thereof, is increasing.



2 AIR

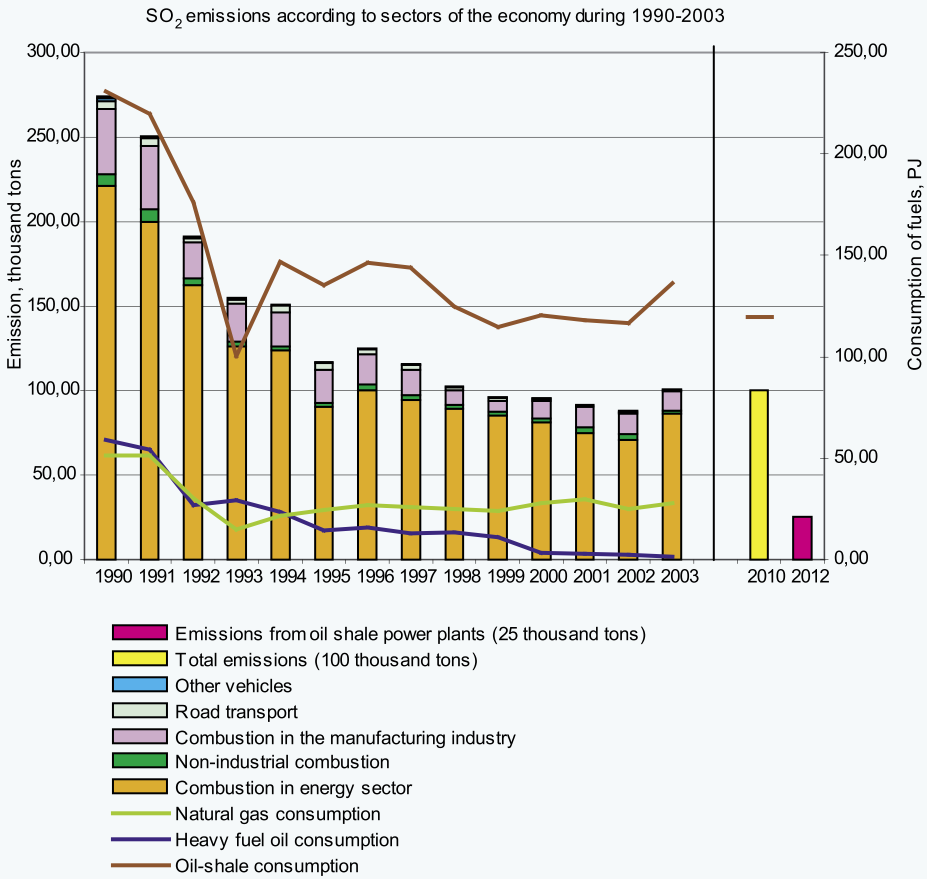
2.1 ACIDIFICATION

Indicator: Emissions of acidifying substances: sulphur dioxide

Target: Total emission of sulphur dioxide, discharged to the ambient air from stationary and mobile sources of pollution, may not exceed 100, 000 tonnes (by 2010) and the emissions of SO_2 emitted from oil-shale-based power plants, may not exceed 25, 000 tonnes (by 2012)➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Main polluters of ambient air with SO_2 are the enterprises producing electricity and thermal power (85.5% of emission volumes all over Estonia, whereas the percentage of oil-shale-based power plants is 82%) and the industrial undertakings which utilise fuel with sulphur content (11.3%). The proportion of other pollution sources is less significant. During the period 1990-2003, the emissions of sulphur dioxide reduced by approximately 63%, conditioned by the decline in energy production. The latter, in its turn, has been caused by the restructuring of the economy. Likewise, the export possibilities, regarding electricity, have also conspicuously decreased. The use of local fuel (incl. wood, oil shale oil) and natural gas has been constantly increasing since 1993, the relevance of heavy fuel oil, in the production of thermal energy, has reduced. Industrial output decreased within the period 1991-1994 and thereafter began to grow again. Gross domestic product has been constantly increasing since 1995. Further decreasing of SO_2 emissions is directly dependent on the measures implemented in power plants operating on oil shale.



SO_2 emissions according to sectors of the economy during 1990-2003
Emission, thousand tons
Consumption of fuels, PJ
300,00
250,00
200,00
150,00
100,00
50,00
0,00
250,00
200,00
150,00
100,00
50,00
0,00
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2010 2012
Emissions from oil shale power plants (25 thousand tons)
Total emissions (100 thousand tons)
Other vehicles
Road transport
Combustion in the manufacturing industry
Non-industrial combustion
Combustion in energy sector
Natural gas consumption
Heavy fuel oil consumption
Oil-shale consumption

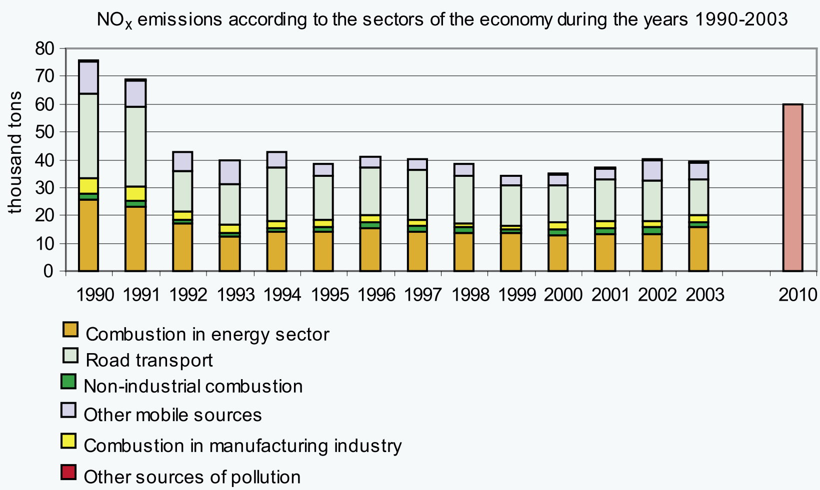
Indicator: Emissions of acidifying substances: nitrogen oxides

Target: Total emission of nitrogen oxides from stationary and mobile pollution sources in Estonia should not exceed 60, 000 tonnes a year as of 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

If, in the case of SO_2, energy industry is the main polluter of ambient air, then the largest proportion of NO_x is emitted from mobile pollution sources (in 2003, the relevant percentage in all of Estonia was 48.5%) and combustion facilities (51%). During the period 1990–2003, the emission of NO_x reduced by 48.2%, within the same period, emissions from the energy sector have decreased 40% and more than twice from the transport sector.

The content of nitrogen dioxide and nitrogen oxides in the ambient air has not particularly altered within the course of years, according to the data of the background stations, and has remained significantly lower than the annual average limit value laid down for the pollution level of nitrogen oxides – 30 g/m^3. Measurement outcomes of the recent years refer to certain decline in the pollution level of the ambient air. The average concentration of nitrate and ammonia nitrogen of the recent three years is approximately 0.4 mg N/l. Differently from sulphur, the average nitrogen concentration of precipitation is not referring to a decreasing trend in Estonia.

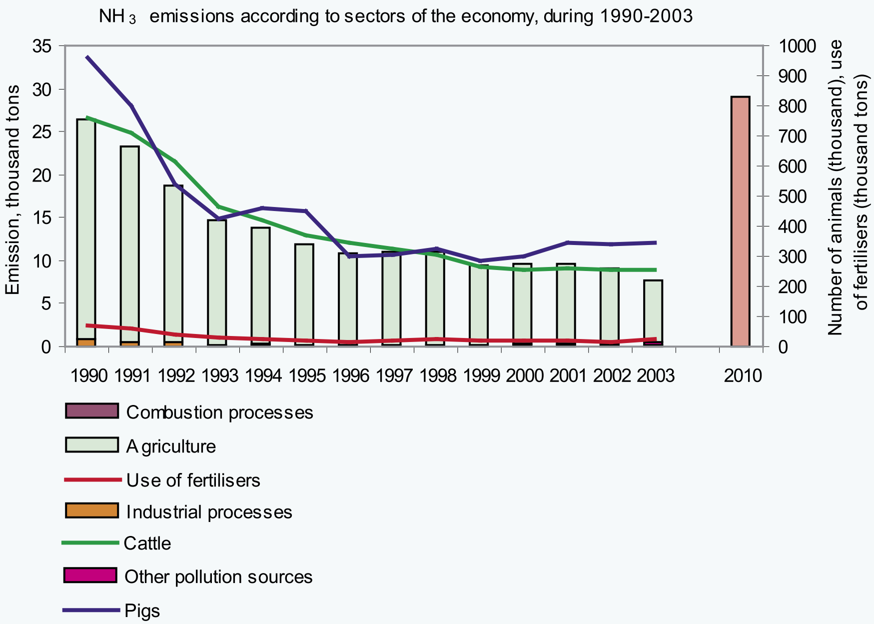


Indicator: Emissions of acidifying substances: ammonia

Target: Total emission of ammonia from stationary and mobile pollution sources in Estonia should not exceed 29, 000 tonnes a year as of 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The use of manure and mineral fertilisers in agriculture serves as the main pollution source regarding ammonia. Within the years 1990-2003, the emissions of ammonia decreased in connection with the reduction in the number of animals and use of fertilisers.



2.2 GROUND LEVEL OZONE

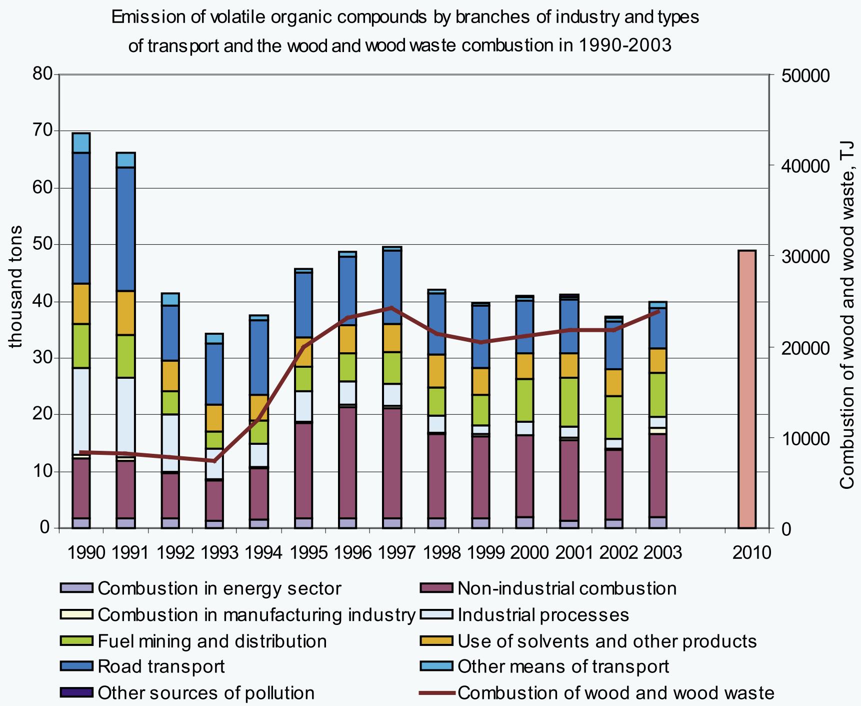
Indicator: Emissions of ozone precursors: volatile organic compounds

Target: Total emission of volatile organic compounds (hereinafter NMVOC) from local and mobile sources of pollution should not exceed 49, 000 tonnes and the emission of nitrogen oxides 60, 000 tons as of 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

NMVOC-s emit from different sources of pollution – combustion of fuel, especially from small boiler houses and household stoves, where more wood, wood waste and peat is used (emissions factor of pollutants is higher there than in bigger boiler houses); from means of transport (road transport, agricultural machinery, inland water transport etc); from using solvents and distribution of fuel. In 1990–2003 the emission of NMVOC decreased by 42.8%. At that emission from transport decreased by 69%, this in relation to decrease of petrol and diesel consumption (respectively 45% and 36%). Emission from non-industrial fuel combustion (households, agriculture and business and public sector) has grown to 38.8%, it is caused by an increase tendency of wood and wood waste combustion.

The main problem is the level of ambient air pollution that in spring and summer exceeds the respective target value. In addition to solar radiation the formation of ozone depends also on the content of different compounds or the so-called "ozone precursors" in ambient air. These compounds are, for example, nitrogen oxide and different organic compounds. In background areas we often have to deal with natural VOC. For example, VOC generated in forests (mainly isoprene and monoprene) form half of Estonian VOC emission. The annual mean content of ozone in ambient air can be compared with the respective indicators of urban air, but in spring and summer the level of ambient air pollution with ozone is constantly over 8 hours of target value (SSV_8=120 µg/m^3).



Emission of volatile organic compounds by branches of industry and types of transport and the wood and wood waste combustion in 1990-2003
thousand tons
Combustion of wood and wood waste, TJ
80
70
60
50
40
30
20
10
0
50000
40000
30000
20000
10000
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2010
Combustion in energy sector
Non-industrial combustion
Combustion in manufacturing industry
Industrial processes
Fuel mining and distribution
Use of solvents and other products
Road transport
Other means of transport
Other sources of pollution
Combustion of wood and wood waste

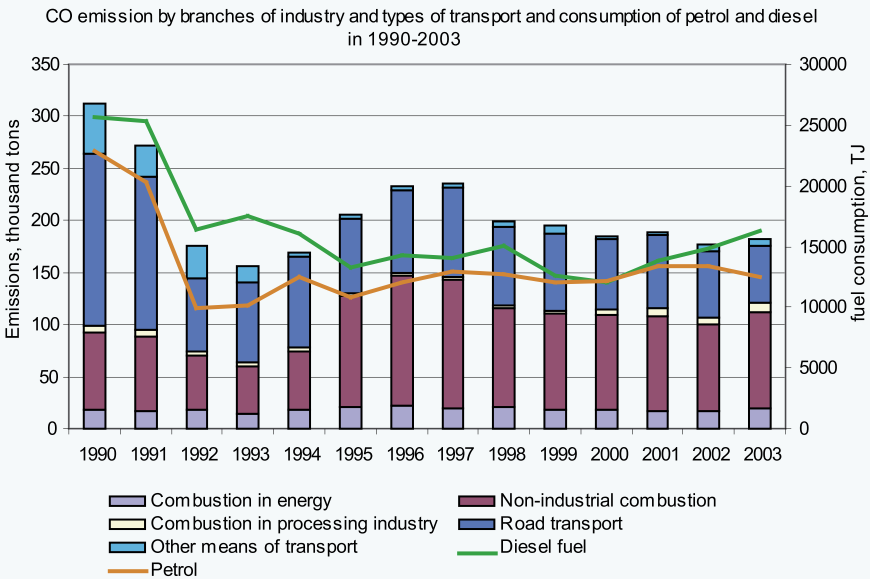
Indicator: Emissions of ozone precursors: CO

Target: No specific target

Between 1990–2003 the emission amounts of CO decreased approximately by 67%, that was, among other things, caused by the reduction in the use of vehicle fuels and in recent years also by a decrease in the number of cars using petrol. In 2003 the biggest polluters were small combustion facilities using solid fuel and household stoves (61%), also means of transport (33%).

Although there are no specific emission targets set for CO, it is affected by several Directives and Protocols. For example, carbon monoxide is covered by the second daughter Directive under the Air Quality Directive. This gives a limit of 10 mg/m^3 for ambient air quality to be met by 2005.

A target value for the protection of human health is 10 mg/m^3 as maximum daily 8-hour mean.

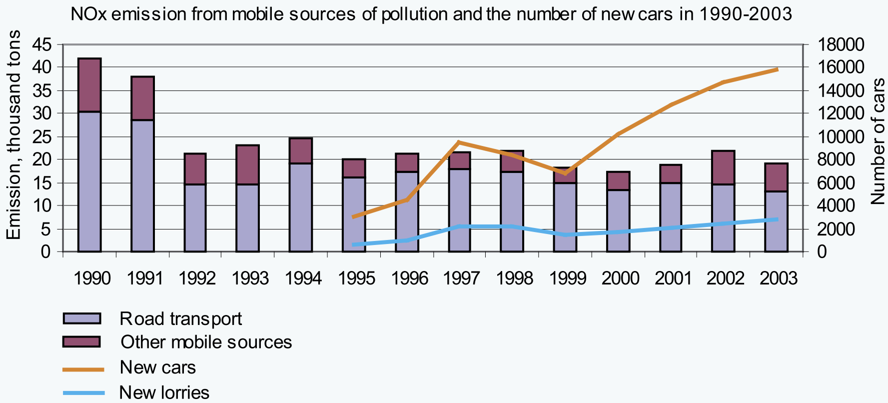


Indicator: Emissions of ozone precursors: NO_x

Target: Total emission of nitrogen oxides from stationary and mobile pollution sources in Estonia should not exceed 60, 000 tonnes a year as of 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The largest source of pollution for nitrogen oxides is transport (57.8%). The cause for reduction of NO_x emission amounts from mobile sources of pollution in 1990–2003 is mainly the same as in case of VOC and CO; increase in the number of cars with catalyzer has played a role also. The number of old cars is very big in Estonia – there are 69% of cars and 70% of lorries from the total amount of cars that are older than 10 years. At that the number of new cars has increased more than 5 times compared to 1995.



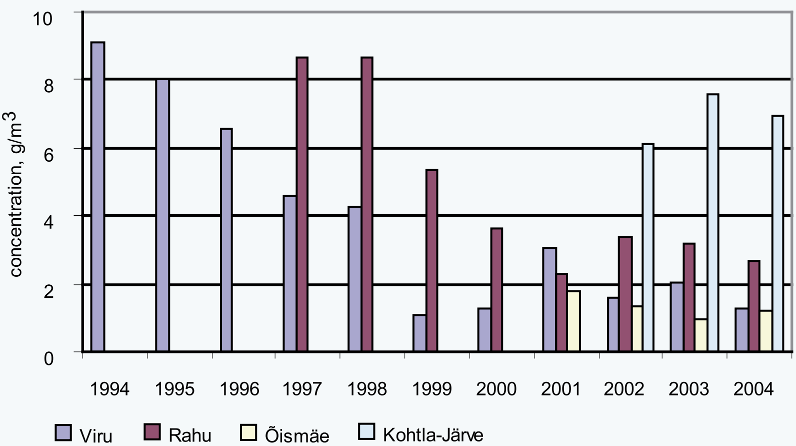
2.3 STATUS OF URBAN AMBIENT AIR

Indicator: Exceedance of air quality limit values in urban areas: SO_2

Target: 1. An hourly limit value for the protection of human health has been set at 350 microgramme SO_2/m^3; this level may not be exceeded more than 24 times a calendar year;
2. The mean limit level has been set at 125 microgramme SO_2/m^3. This value may not be exceeded more than three times a calendar year ➲.
➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The level of urban air pollution with sulphur dioxide has decreased in comparison with earlier years. Probably, this is conditioned by more strict limit values for sulphur content in liquid fuels, particularly in diesel fuel. In comparison with Tallinn, the concentration of sulphur dioxide in Kohtla-Järve shows a growing tendency, one of the relevant reasons being an increase in oil shale processing volumes.

Average annual concentration of sulphur dioxide in urban ambient air



Indicator: Exceedance of air quality limit values in urban areas: NO_2

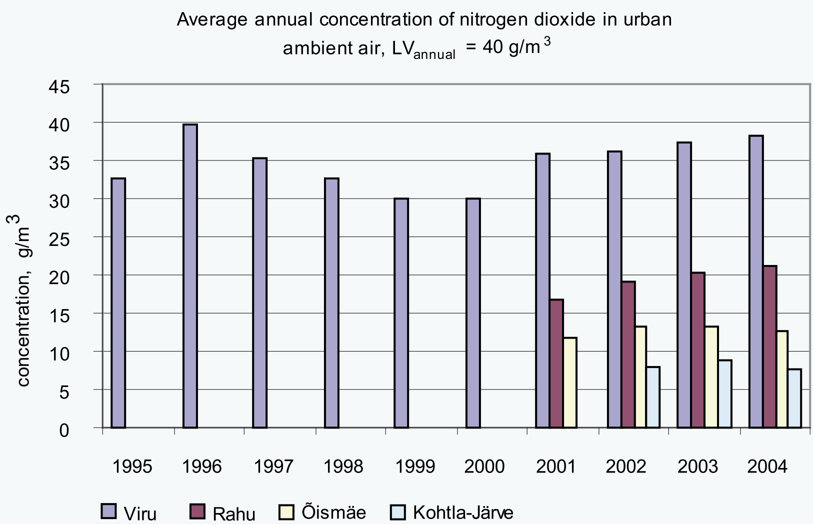
Target: 1. An annual mean limit value for nitrogen dioxide of 40 microgramme NO_2/m^3 has been set for the protection of human health.

2. An hourly limit value of 200 microgramme NO_2/m3 not to be exceeded more than 18 times a calendar year has been set as of 2010➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee

Related policy documents - http://eur-lex.europa.eu

The level of ambient air pollution with nitrogen dioxide, measured in monitoring stations, shows an increasing trend during the recent years. The likely reason for this is an augmenting number of means of transport. The level of pollution, however, remains below the set maximum limits, except for the measurements in the Viru monitoring station, where the annual average level of pollution is close to the maximum limit (LV_{annual} = 40 µg/m³).



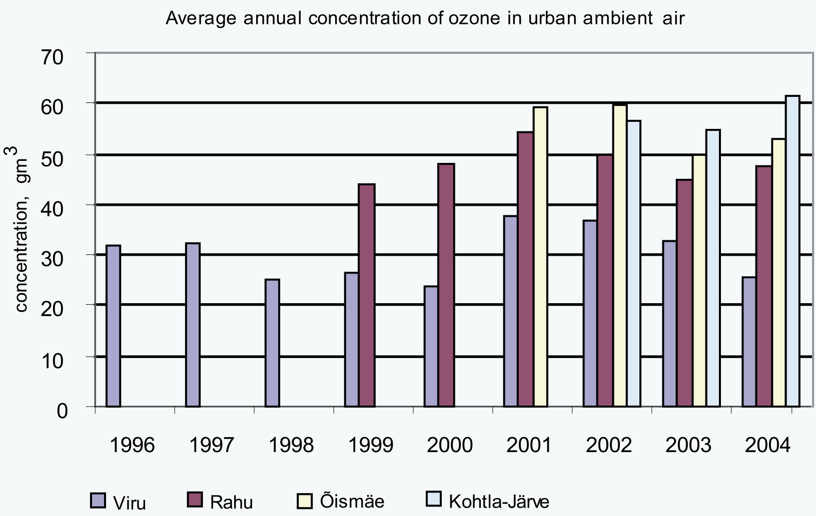
Indicator: Exceedance of air quality limit values in urban areas: ozone

Target: A target value for the protection of human health is 120 microgramme O_3/m^3 as maximum daily 8-hour mean, not to be exceeded more than 25 days per calendar year, averaged over three years. This target should be met in 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee

Related policy documents - http://eur-lex.europa.eu

The average annual ozone pollution level of ambient air has not altered significantly in the course of years. Nevertheless, there are occurrences where the average maximum limit value per one hour, regarding the pollution with ozone, has been exceeded in Õismäe and Rahu monitoring stations.



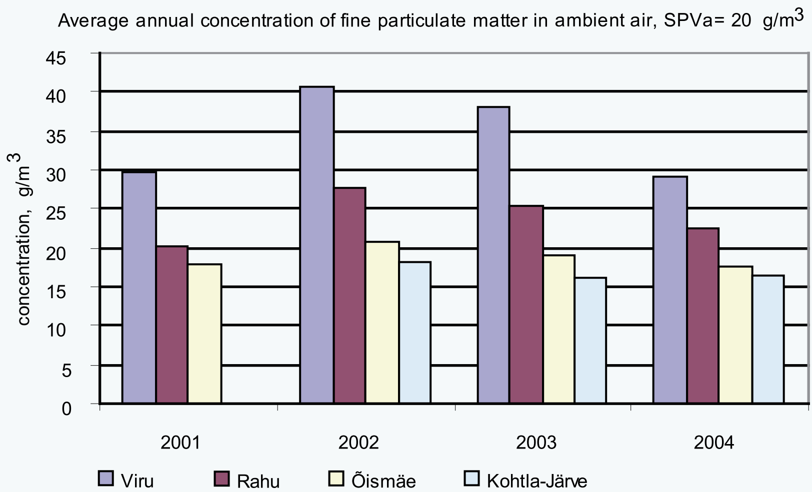
Indicator: Exceedance of air quality limit values in urban areas: PM_{10}

Target:

1. A limit value for PM_{10} of 50 microgramme/m^3 (24-h average, i.e. daily) should not be exceeded more than 7 times a calendar year.
2. The annual mean limit value is 20 microgramme/m^3 as of 2010 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Similarly to other European countries, the content of fine particulate matter (PM_{10}) in ambient air is also one of the more serious problems in Estonia. Fine particulate matter in inhaled air constitutes the main threat to people's health. The average limit value, 40 µg/m^3, set for the pollution with fine particulate matter during earlier years, has been replaced, in 2005, by a more strict limit value – 20 µg/m^3. The latter is being exceeded in the majority of large cities. Likewise, Tallinn is also experiencing problems with regard to exceeding the 24 h average limit value (LV_{daily} = 50 µg/m^3) for fine particulate matter.

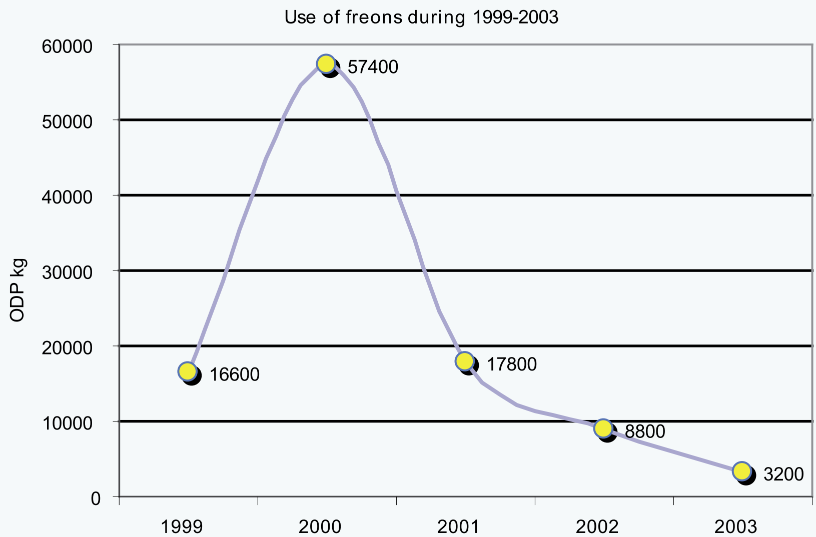


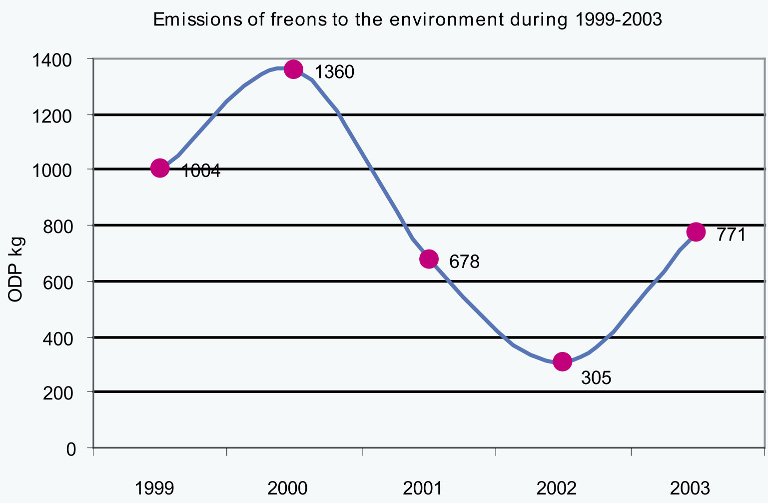
Indicator: Production and consumption of ozone depleting substances

Target: to stop the import, export and use of greenhouse gases and substances depleting the ozone layer ➲.
➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The main part (> 90%) of the ozone-depleting substances, still used in Estonia, are such freons which are either fully or partially halogenised fluoro-chloroalkanes. Currently the process of replacing them with partially or fully fluorinated alkanes is under way.

The data with regard to the use of freons in Estonian enterprises and relevant emission to the environment originates from the Estonian Statistical Office's collections "Keskkond" (The Environment) 1999-2003. The figures present the use of freons depleting the ozone layer and the emission, within the period 1999-2003, ODP (ozone depletion potential) in kilograms. During this period under observation, the use of such freons has significantly decreased. Relevant emissions have also reduced, in parallel with lessened use. However, the year 2003 was an exception, when fishing enterprises used larger quantities of freon 22 than during previous years.


Use of freons during 1999-2003
ODP kg
60000
50000
40000
30000
20000
10000
0
57400
16600
17800
8800
3200
1999
2000
2001
2002
2003


Emissions of freons to the environment during 1999-2003
ODP kg
1400
1200
1000
800
600
400
200
0
1360
1004
678
305
771
1999
2000
2001
2002
2003

3 BIOLOGICAL DIVERSITY

3.1 PROTECTION OF SPECIES COMMUNITIES

Indicator: protection status of species diversity

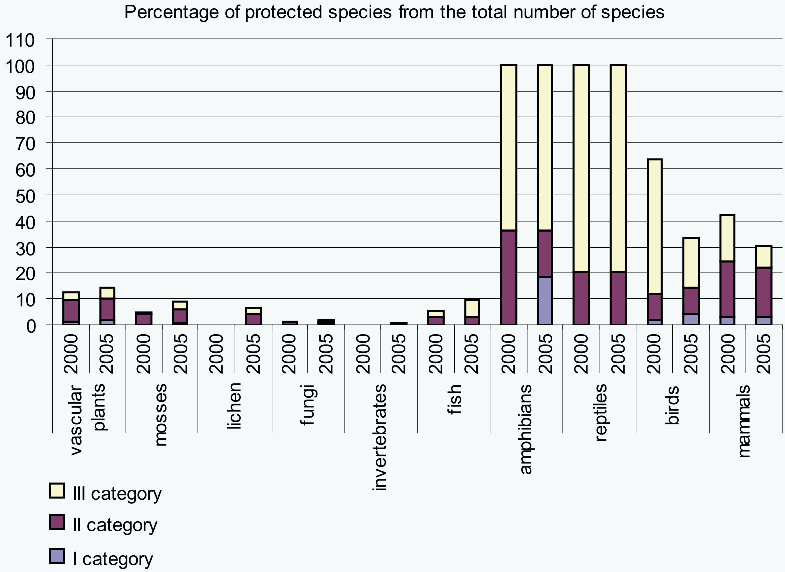
Target:

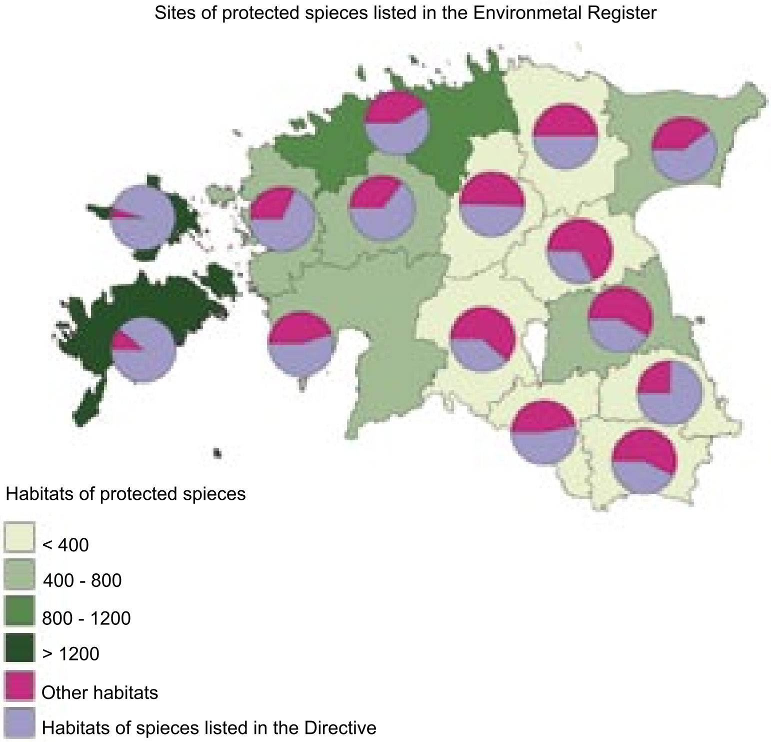
1. To proceed, upon the organisation of protection of species and communities, from a goal to guarantee them with a favourable status
2. To enhance the protection of natural and semi-natural habitats (communities), the protection of plant and animal species, their habitats and landscapes, pursuant to the renewed legal provisions, international agreements and the requirements of the European Union ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Strategic objectives for protection of species communities result from Estonia's Environmental Strategy until 2010. A significant change in the protection of species took place in 2004, when, pursuant to the Nature Conservation Act, it is possible to implement the protection of a habitat of a protected species, in addition to the protection of individual specimens.

In the case of birds and mammals, the decline in protected species is conditioned by the fact the Animal Protection Act and the Hunting Act precisely determine the cases as to when the killing of an animal is allowed. Thus, it is also not permitted to simply kill the animals which are not under protection. Proceeding from this, it is not any more relevant, with regard to a number of species, to provide them with the status of a protected species.


Percentage of protected species from the total number of species
110
100
90
80
70
60
50
40
30
20
10
0
2000
2005
vascular plants
mosses
lichen
fungi
invertebrates
fish
amphibians
reptiles
birds
mammals
III category
II category
I category


Sites of protected spieces listed in the Environmetal Register
Habitats of protected spieces
< 400
400 - 800
800 - 1200
> 1200
Other habitats
Habitats of spieces listed in the Directive

This figure demonstrates the sites of protected species and their percentage with regard to the species listed in the Annexes of the EC Directive 79/409/EEC on the conservation of wild birds (bird directive) and EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (habitat directive) (as of 01.01.05).

The aim of the Birds Directive is the protection of natural bird species and their habitats. The goals of the Habitat Directive is the ensuring of biological diversity by way of protecting natural habitats and the fauna and flora. In Hiiumaa and Saaremaa, the proportion of species, listed in the Bird and Habitat Directives, is small, as the prevailing part of local habitats of these species coincide with the ones for protected plant species. Only a small number of plant species protected in Estonia have been listed in the Annexes of the Habitat Directive.

3.2 PROTECTED AREAS AND NATURA 2000

Indicator: Designated Areas

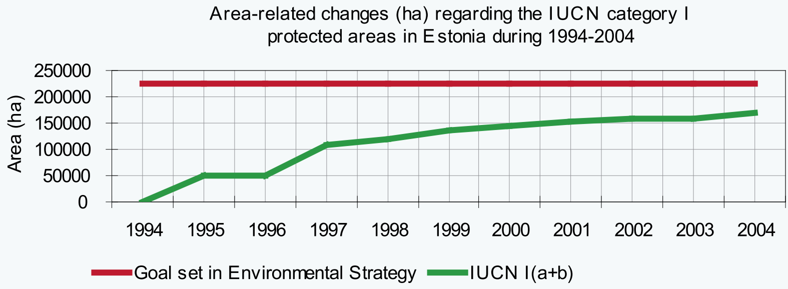
Target:

1. To create, pursuant to the EU recommendations, a network of protected areas (Natura 2000) in which the more strictly protected zones (strict nature reserves and special management zones) would encompass up to 5% of the Estonian land territory
2. to determine the percentage of protected areas and Natura sites in the territory of Estonia (no less than 10%) ➲.

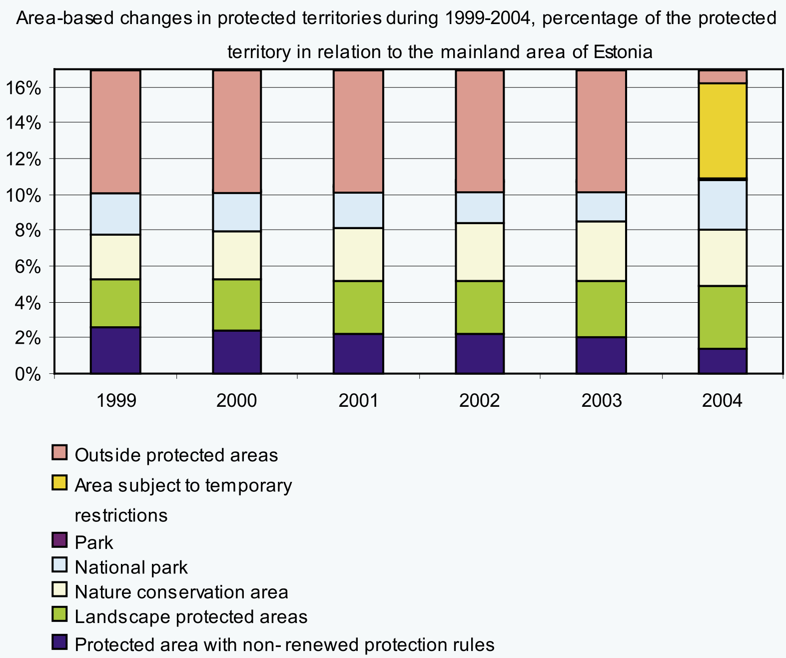
➲ Estonia's Environment Strategy until 2010
www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Circa 75% of the goal set in the Environmental Strategy have been accomplished, meaning that as of 01.01.2005, there are 169, 633 ha of the IUCN (the International Union for the Conservation of Nature and Natural Resources) category I (a+b) areas, i.e. ~ 3.8% of the territory of Estonia.

The Natura 2000 areas subject to temporary restrictions of economic activities (hereinafter referred to as areas subject to temporary restrictions) added to the list of protected areas on 1 May 2004, have significantly increased the size of the protected territory. As of 01.01.2005, the protection rules of 155 protected areas have been approved. In Estonia, there are 5 national parks, 55 nature conservation areas, 95 landscape protection areas, 554 parks, 218 protected areas with non-renewed protection rules and 459 areas subject to temporary restrictions. Special conservation areas and species' protection sites, partially formed on the basis of areas subject to temporary restrictions, will be added to the aforementioned in 2005. In 1999, protected areas constituted 10.0% of the mainland territory of Estonia; 0.9% was added to this by the end of 2004, thus, the total is 10.9%. When adding the areas, subject to temporary restrictions, to this figure, we obtain the total percentage – 16.3 %.



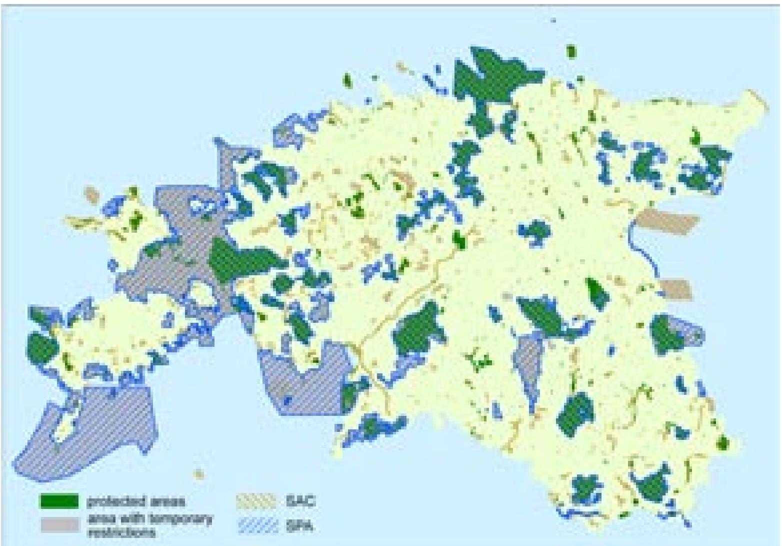
IUCN category	Relevant interpretation for Estonia
Ia	Strict nature reserve
Ib	Natural part of the special management zone
III	Individual natural objects
IV	Maintained part of the special management zone, provided this has been created for the purposes of the protection of species
V	Maintained part of the special management zone (created for other purposes) and the limited management zones of landscape protection areas
VI	Limited management zone of the nature conservation area and national park



The Estonian State submitted the list of Natura 2000 sites to the European Commission by the moment of joining the European Union. This list comprises 66 Special Protection Areas (SPA) with the total territory of 1, 236, 808 ha and 509 Special Areas for Conservation (SAC) areas with the total area of 1, 058, 981 ha.

SAC and SPA areas coincide either partially or fully, there are altogether 490 Natura 2000 sites with the total area of 1, 422, 500 ha. 51% is located in the sea, the total area of Natura 2000 sites on the land is 691, 800 ha.

The Natura 2000 areas in Estonia have been selected for the protection of the more relevant habitats of 66 bird species, more important staging posts, wintering and moulting areas of 70 migratory species mentioned in Annex I of the Bird Directive, and for the protection of 60 habitat types listed in Annex I and the more representative finding sites of 51 flora and fauna species listed in Annex II of the Habitat Directive.



4 CLIMATE CHANGE

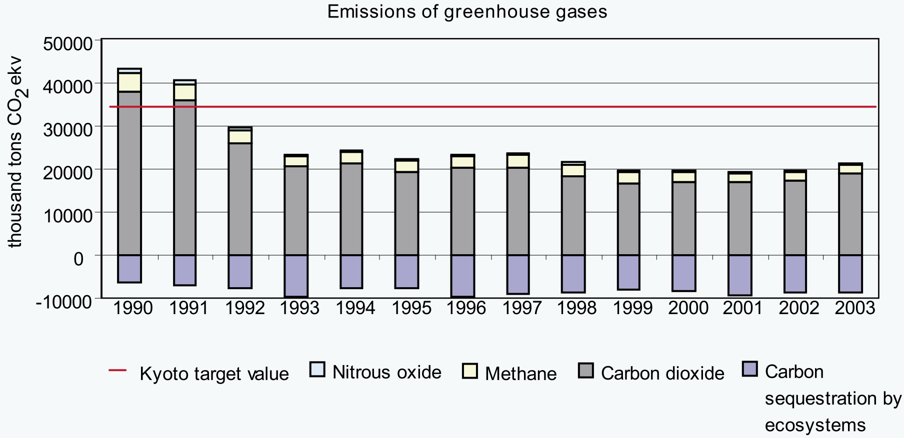
Indicator: Greenhouse gas emissions and removals

Target: to perform the obligations proceeding from the Kyoto Protocol ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Kyoto Protocol
http://unfccc.int/2860.php

The states who have joined the Kyoto Protocol have set an objective to reduce the emissions of greenhouse gases during 2008–2012 by 5% on average, in comparison with 1990. Estonia assumed an obligation to decrease the emission by 8%, which means that in order to reach the Kyoto target value (34.2 million tons CO_2), Estonia, as of 2008, has to reduce the emission of greenhouse gases by 2.973 million tons, compared with 1990.

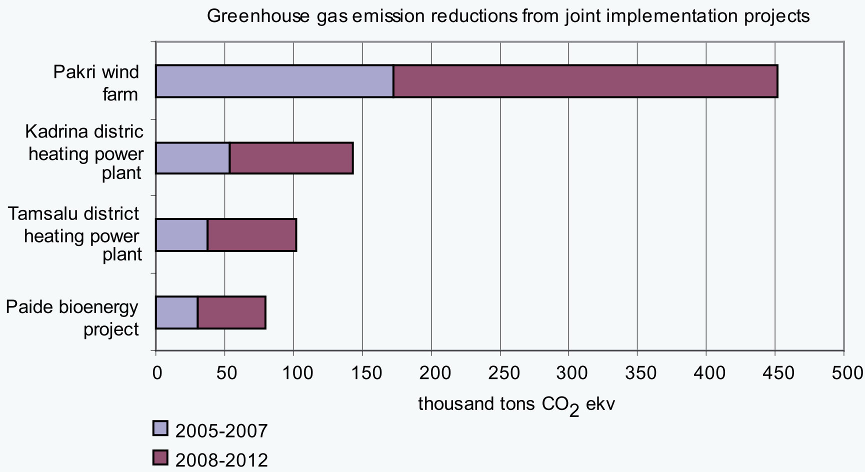
Restructuring of the economy in Estonia at the beginning of the 1990s has resulted in a significant decline in the emissions of greenhouse gases. Currently, the emissions are more than a third smaller than in 1990. This has made it likely that Kyoto target number will not be exceeded in 2008. At the same time, it is necessary to make sure that Estonia would continuously keep the greenhouse gas emissions at a low level. In April 2004 the government approved the national programme for the reduction of greenhouse gas emissions (2003-2012).

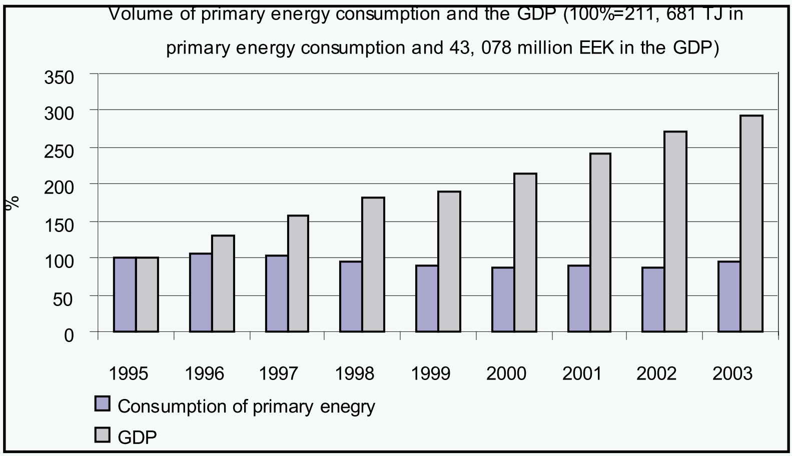


In order to reduce the emissions of greenhouse gases, Estonia can use one of the two Kyoto project-based mechanisms – joint implementation. At the moment, it is possible to carry out co-operation with Finland, Denmark, the Netherlands and Sweden, in the future also with Austria. The principle of project-based activity actually means that the investor country reduces greenhouse gases in some other country where it is cheaper to do so. As a result, both parties gain from this – the host country obtains new technology and knowledge, in addition to the proceeds from the sale of emission reduction units.

Currently, there are four joint implementation projects in the development phase in Estonia, envisaging the anticipated amount of reduced greenhouse gases to be 777 thousand tons of carbon dioxide during the period 2005-2012. As regards these four projects, Finland has been the investing country. During the forthcoming years, it is possible to look forward to new projects.

When increasing the percentage of renewable energy sources in the consumption of primary energy (e.g., by increasing the share of the so-called renewable electricity to 5.1% of gross consumption by the year 2010), the use of fossil fuels decreases and thus, also the emissions of greenhouse gases which, in the end, contribute to the alleviation of climate change. In Estonia, the level of primary energy use has stabilised after a downtrend at the beginning of the 1990s, reaching 200, 000 TJ/y. The consumption level, pursuant to the objectives of the national development plan, has become the same with that of the year 2003 – 201,892 TJ. Energy consumption per capita is relatively high due to climatic conditions and low population densities, somewhat similar to Nordic neighbours. Energy intensity per unit of GDP is similar to other (industrialised) EU-10 Member States.


Greenhouse gas emission reductions from joint implementation projects
Pakri wind farm
Kadrina distric heating power plant
Tamsalu district heating power plant
Paide bioenergy project
0
50
100
150
200
250
300
350
400
450
500
thousand tons CO2 ekv
2005-2007
2008-2012


Volume of primary energy consumption and the GDP (100%=211, 681 TJ in primary energy consumption and 43, 078 million EEK in the GDP)
%
350
300
250
200
150
100
50
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
Consumption of primary enegry
GDP

5 FISHERY

5.1 REDUCTION OF FISHING CAPACITY

5.1 REDUCTION OF FISHING CAPACITY

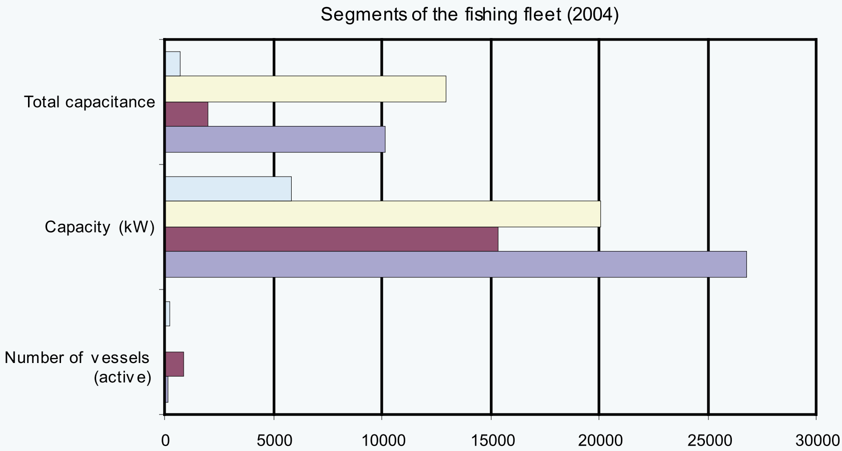
Indicator: Fishing fleet capacity

Target: No specific target. The aim is to reduce the capacity of the fishing fleet to achieve sustainable fishing

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The existence of fish resources as a natural resource is directly dependent on human activities, incl. the fishing capacity conditioned by the fishing fleet; these two factors should be in balance. In the majority of countries of the world, the development of the fishing fleet has by today reached a level where its total fishing capacity remarkably exceeds the fish resources to be used. Subsidies in the fishing sector and too easy an access to fishing resources have been the two main preconditions for the generation of excessive fishing capacity in European countries. In Estonia, there is no subsidising of fish catching, however, during the second half of the 1990s, surplus catching quantities were caused by the utilisation of high capacity fishing fleet without restrictions, resulting in a conspicuous reduction of catching possibilities. During this period, fishing was limited by way of prescribed quotas (TAC), whereas the size of the fleet (fishing capacity) was not subject to direct restrictions. As of 2004, the fishing fleet register comprises all ships dealing with fish catching in Estonia, operating in the Baltic Sea, ocean fishing, coastal fishing and inland waters. A proper overview guarantees the set objective – reduction of fishing capacity. For this purpose, fishing vessels are split into segments according to the fishing region, fishing gear and the overall length of the fishing vessel. The figure refers to four different segments:

4S1 – vessels with overall length 12 m and more;
4S2 – vessels with overall length less than 12 m;
4S3 – vessels with overall length 24 m and more;
4S4 – vessels used on inland waters.



	4S1	4S2	4S3	4S4
Number of vessels (active)	152	889	10	255
Capacity (kW)	26839	15326	20110	5862
Total capacitance	10137	1981	12923	750,1

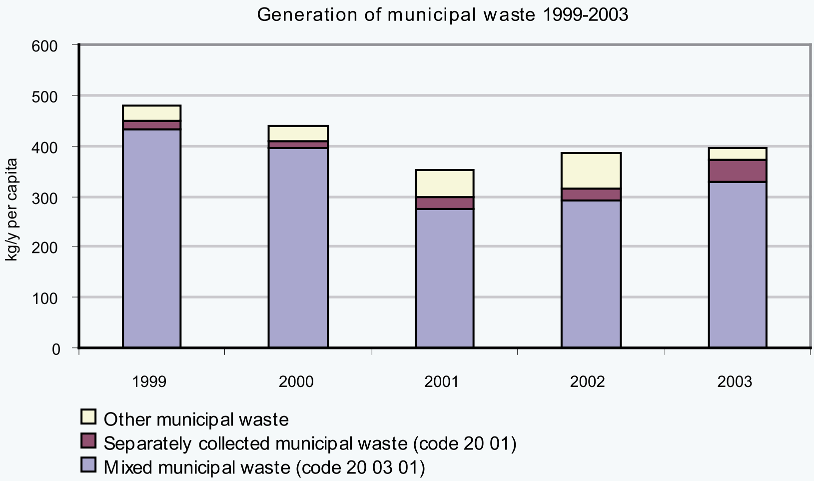
6 WASTE

6.1 GENERATION AND HANDLING OF MUNICIPAL WASTE (INCLUDING SEPARATELY COLLECTED WASTE)

Indicator: Municipal waste generation

Target: to stabilise the annual generation of municipal waste per person for the years 2005–2006, to decrease the hazardousness of municipal waste; to recover 30–40% of waste, to more widely promote and direct the sorting of municipal waste in households, to more intensively introduce the sorting of waste in the industry, service and commerce in order to decrease the quantities of municipal waste directed to landfills ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

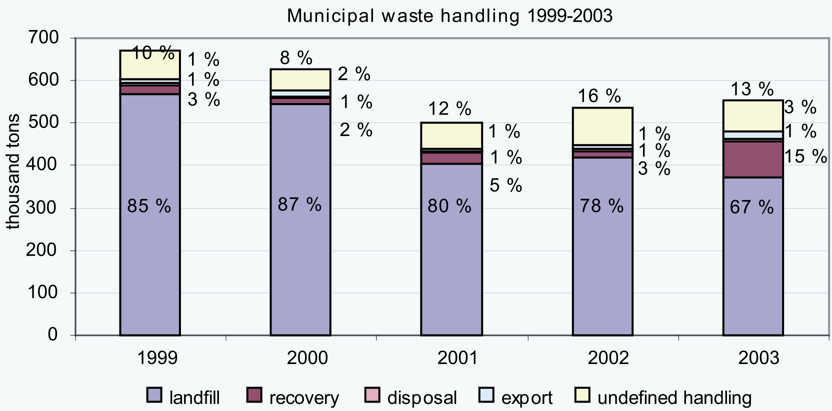


The share of municipal waste forms an average of 4% of the overall generation of waste in the course of years. Approximately 60% of refuse or mixed municipal waste comes from households, the rest from institutions and enterprises. In 1999–2003, on average 410 kg of municipal waste was annually generated per capita.

Generation of municipal waste during 1999-2003 (kg/y per capita)

	1999	2000	2001	2002	2003
Refuse, mixed municipal waste (Code 20 03 01)	432	397	275	292	328
Separately collected municipal waste (Code 20 01)	16	12	23	25	43
Other municipal waste	30	32	54	69	25
Number of inhabitants (million)	1,379	1,372	1,367	1,361	1,356

In 1999–2003 the share of municipal waste deposited in landfills has significantly decreased, forming only 67% of the total amount of municipal waste generated in 2003. This was mainly due to the implementation of the Packaging Act and the Packaging Excise Duty Act, promoting the recovery of the packaging and packaging waste of alcoholic and non-alcoholic beverages, the extension of the separate collection of waste and sorting of municipal waste by fractions in the new Tallinn Waste Sorting Plant. According to the waste report of 2003, the plant sorted 20% usable waste, including 11% of packaging waste, out of 60,000 tonnes of mixed municipal refuse. In 2003, AS Vaania also dealt with the sorting of municipal waste and according to their report, 40% of 1,707 tonnes of mixed municipal waste was sorted out as usable materials, including 34% paper, cardboard and glass in total. The sorting of waste and the recovery of the separated material has increased the recovery of annually handled municipal waste from 3 per cent to 15 per cent during the described period of time.



6.2 GENERATION AND RECOVERY OF PACKAGING WASTE

Indicator: Generation and recycling of packaging waste

Target:

1. To avoid and reduce the generation of waste from used packaging, to stop the increase in the quantity of packaging waste by 2006, to reduce the undesirable (adverse) effect of packaging and packaging waste on people and the environment – landfilling of waste should be the last handling method
2. To promote the recycling or other forms of recovery of packaging or packaging material in a way, which would ensure the recovery of packaging waste in the extent prescribed by the Packaging Act ➲.

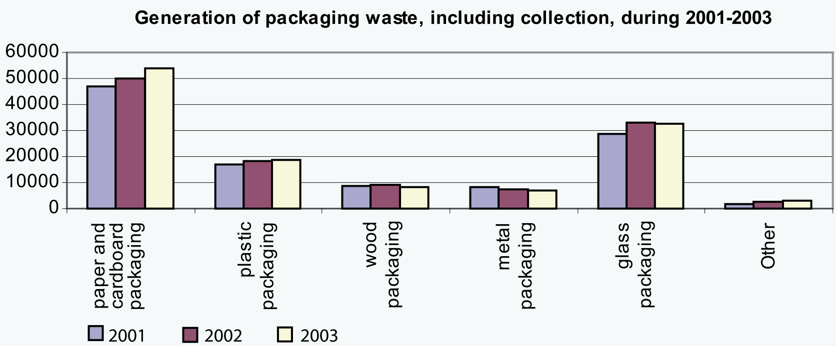
➲ Estonia's Environment Strategy until 2010
www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Packaging waste constitutes a large part of municipal waste. According to waste reporting, packaging waste formed on average 23% of the total quantity of municipal waste during 2001–2003. The quantities of packaging waste have increased over the years, making a significant growth in 2002. Partially, this may also be caused by the improvement of the quality of the information regarding waste related data. Further annual increase has been approximately 3%. Such a tendency for growth has also been predicted for the nearest future. During 2001–2003 an average of 87 kg of packaging waste per capita was generated annually, reaching as much as 91 kg in 2003.

According to surveys and practical experiences of waste handlers, packaging waste forms approximately 2/3 of paper and cardboard waste included in municipal waste. Surveys have also shown a large percentage of packaging waste within glass waste (approx. 100%), metal and plastic waste (approx. 80%) included in municipal waste. Packaging waste is forming also a substantial part of wood and composite material fractions of municipal waste.

The fractional content of packaging waste or the share of different packaging materials within the general quantity of packaging waste remained relatively stable during 2001–2003. An average of 43% of paper and cardboard, 27% of glass, 15% of plastics, 7% of wood, 6% of metal and 2% of other materials were included in the content of packaging waste, according to estimations. At the same time, in 2003, the percentage of paper and cardboard has started to increase and the percentage of glass has started to decrease in packaging waste.

Significant changes have taken place in waste handling in 2003. Despite a conspicuous increase in the quantities of packaging waste, the recovery and export of waste remained at a relatively low level in 2001 and 2002, in comparison with the generation of waste. In 2003, the recovery of waste increased by approximately 50% (according to calculations) and the export for recovery increased by 80%, in comparison with 2002, however, the results prescribed by target figures were not yet achieved.

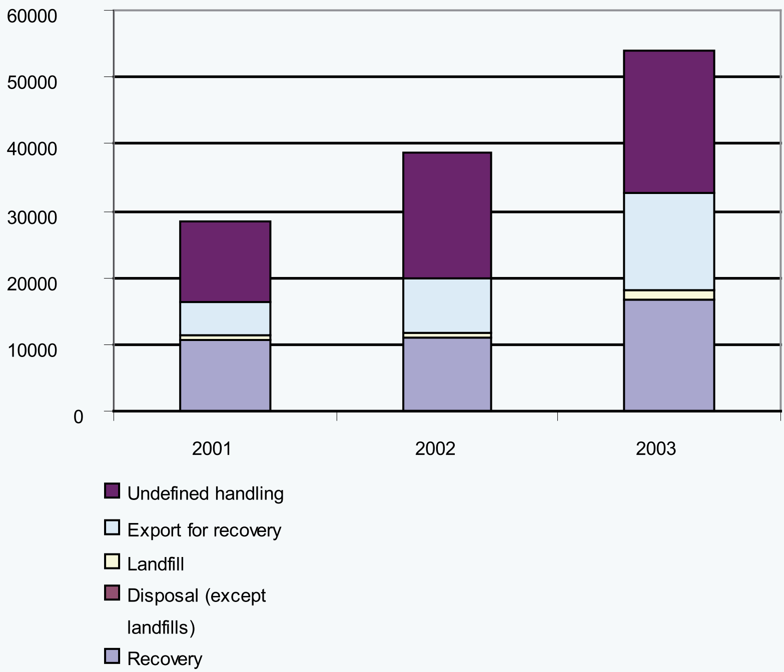


Generation and handling of packaging waste (tons/per year)

	2001	2002	2003
Estimated generation of packaging waste (including in mixed municipal waste + the separately collected waste)***	111073	119741	123681
Import	2292	3156	2154
Recovery of packaging waste generated in Estonia (incl. export for recovery) according to the data of waste reports	13270	16221	29236
Recovery (incl. export for recovery) % of estimated generation	12	14	24

*** The surveys on the fractional composition of municipal waste in 2000 showed that the approximate percentage of packaging waste in the total mass of municipal waste was estimated to be 25-30% in 2000. As at that time, the separate collection was minimal and this has increased over the years, the content of packaging waste in the mixed municipal waste also decreased in 2003. According to estimations, in 2003, the percentage of packaging waste in mixed municipal waste remained even under 20%.

Handling of packaging waste during 2001-2003



7 WATER

7.1 RESOURCES OF WATER
7.2 POLLUTION LOAD
7.3 STATUS OF WATER

7.1 RESOURCES OF WATER

Indicator: Use of fresh water resources

Target: To promote sustainable use of water based on long-term protection of available water resources; as regards water bodies – obtaining a good status of water bodies by 2015 and the preservation thereof ➲.

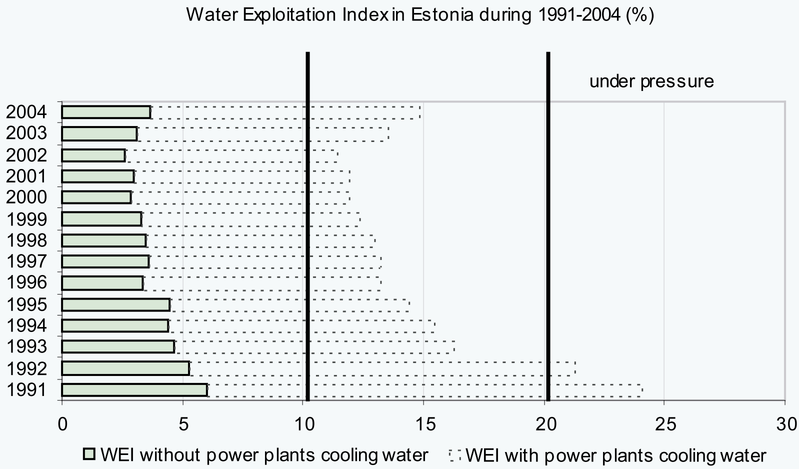
➲ Estonia's Environment Strategy until 2010; www.envir.ee

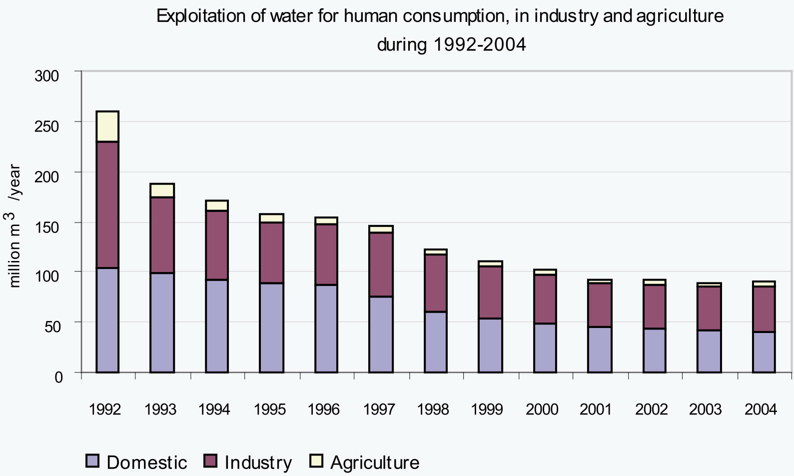
Related policy documents - http://eur-lex.europa.eu

The Water Exploitation Index (WEI) shows how economical the exploitation of natural surface and ground water is in time. The WEI has decreased in Estonia, similar to most of the European countries. In order to describe the pressure that people exert on the supplies of water by the abstraction of water, the amount of annually extracted water is compared with an average long-term annual runoff. Estonia's long-term average annual runoff has been calculated on the basis of a specific runoff module and it amounts over 11 km^3 per year, which is, on the average, more than 8000 m^3 of water per person per year. The indicator refers to the intensity of water resources when in the nature, the annual amount of water per person is less than 1700 m^3. The European annual supply of water slightly surmounts 3500 km^3. Approximately 10% of the European water resources are being currently used.

The use of water began to decrease at the beginning of the 1990s, forming in 2004 less than 50% of the quantity of 1992. The need for water has decreased in electricity production and industry, agriculture and inhabitants' everyday life. The production of cellulose has stopped; the production of food processing industry has decreased. Enterprises have changed their production technology in the direction of water saving in order to reduce their expenses on the supply of water. Water saving also commenced in order to reduce the charge for special use of water. Abrupt increase in the price of water gave rise to reduced consumption of water by the inhabitants. After the collapse of the system of collective farms, agricultural production died away, resulting in a conspicuous decrease in agricultural volumes and the number of farms, consequently also in water exploitation. Additionally, the record-keeping, regarding the use of water by the population of rural settlements, was transferred from the sphere of agriculture to that of municipal water. Agricultural use of water in 2004 was nearly 7 times less than a decade before.

During 1992–2004, the use of water has decreased by more than twice in people's everyday life. The expenditure on the production of water, which increased the price of water, investment and economic and political decisions, urged the population to save water, fostering the correct measuring of water use and the renewal of pipes and sanitary ware.





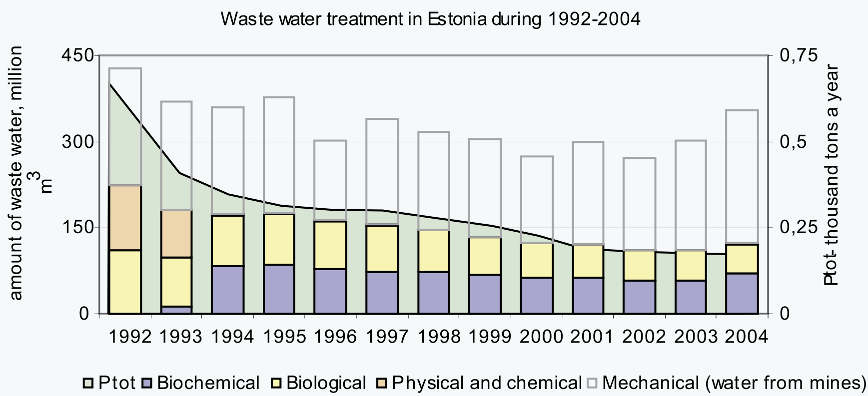
7.2 POLLUTION LOAD

Indicator: Urban waste water treatment

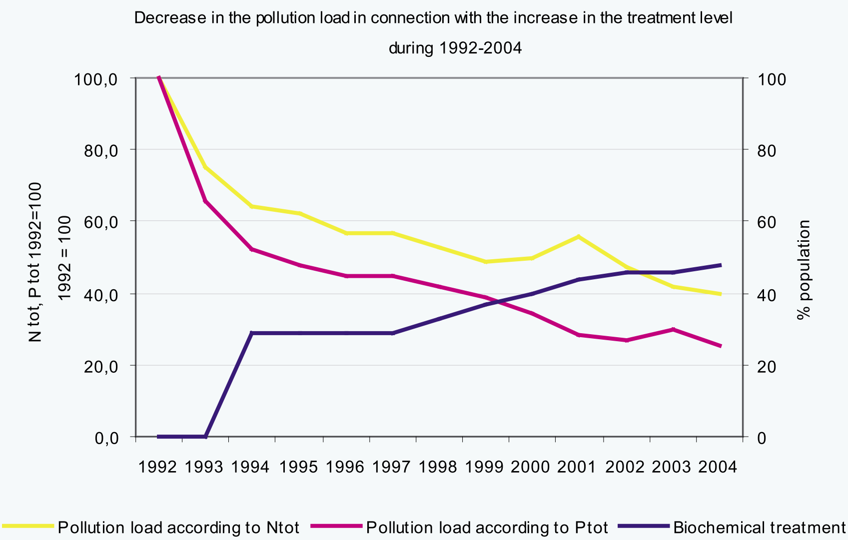
Target: To improve sewage treatment, reduce the contamination of water bodies due to insufficient purification of waste water; all settlements with a pollution load exceeding 2,000 p.e. should be provided with wastewater collection systems. The wastewater of settlements with a pollution load over 2,000 p.e., which is directed into internal water bodies and the wastewater of settlements with a pollution load over 10,000 p.e., which is directed into coastal waters, must be at least biologically treated. In the case of vulnerable receiving water body, biological and chemical treatment must be applied to wastewater ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

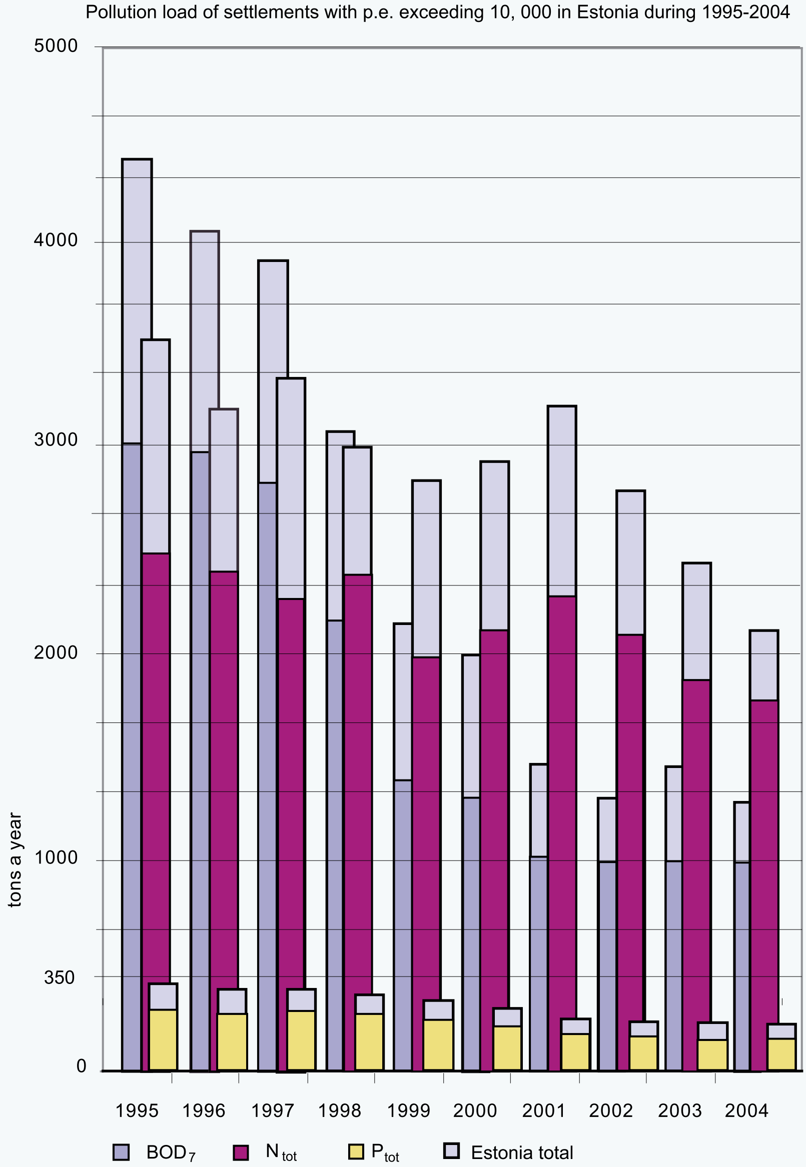
Majority (99% in 2004) of the 356 million m³ of waste water, which needs to be treated, is released in the environment through mechanical, biological, and biological-chemical waste water treatment plants. Water from mines undergoes mechanical treatment in sedimentary basins; the rest of the water goes through biological or biological-chemical treatment. Cooling water does not need to be treated. During the last decade, significant changes have occurred in wastewater treatment; the efficiency of treatment has significantly increased. Since 1994, the waste water in need of treatment undergoes either biological or biochemical treatment, thus giving rise to a considerable decrease in the pollution load with regard to both organic and inorganic phosphorus.



The level of the efficiency of the treatment of waste water in Estonia, as well as all over Europe, has risen since the beginning of the 1990's when biological and chemical wastewater treatment was more increasingly introduced. At present, the effluent of nearly half of the population of Estonia goes through biochemical treatment with removal of phosphorus and/or nitrogen (advanced treatment). A public sewerage system covers more than 72% of the entire population of Estonia.



Pursuant to Council Directive 91/271/EEC concerning urban wastewater treatment, there are 45 settlements with a pollution load exceeding 2,000 p.e. In 27 settlements, the pollution loads remain between 2–10 000 p.e. and in 19 settlements they exceed 10,000 p.e. In Estonia, there is only one settlement, the pollution load of which exceeds 150,000 p.e.; this is Tallinn. Pollution load is expressed in personal equivalents (p.e.), which is the average daily pollution volume generated by one person. More than 820,000 people live in the aforementioned 19 settlements; 90% of them are connected to a public sewerage system, and wastewater is biologically or chemically treated. Regarding BOD7, total N and total P the pollution load together with production load formed 62%, 75% and 68%, respectively, of the total load in Estonia in 2004. Removal of either phosphorus and/or nitrogen, as appropriate, is carried out in the newer wastewater plants of settlements with p.e. exceeding 10,000. Based on large-volume investments, the level of treatment has increased by today and a significant decrease is observed in the pollution load. In association with the construction and renovation of treatment plants and the implementation of the removal of phosphorus, the amount of the organic matter and phosphorus released into water bodies has significantly decreased. As regards nitrogen, the trends is not so abrupt.



7.3 STATUS OF WATER

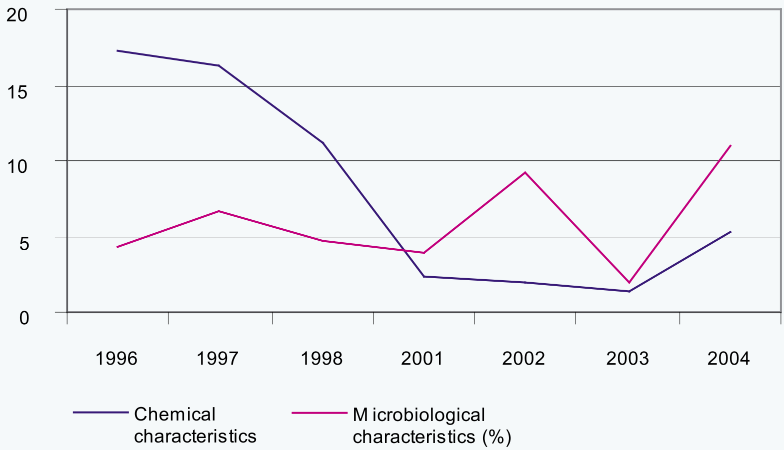
Indicator : Bathing water quality

Target: A body of water or a part thereof, at which a bathing beach has been established or planned, shall belong to at least a good quality class of surface water bodies; the pollution of bathing water be reduced and the further deterioration of the quality thereof be prevented in order to protect environmental and public health. Member States shall take all necessary measures to ensure that, within 10 years following the notification of this Directive, the quality of bathing water conforms to the set limit values ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

In 2004, there were 23 beaches and 105 bathing sites in Estonia. Altogether 420 samples for the determination of the microbiological qualities of water and 435 samples for the determination of the chemical, physical and organoleptic quality of water were taken. 22 of them or 5.2% failed to comply with microbiological requirements and 48 or 11% failed to comply with chemical, physical and organoleptic requirements. The percentage of the samples of bathing water, which failed to comply with the requirements, was significantly higher in 2004 in comparison with 2003. The larger number of non-conformities was primarily associated with the floods in July. Regarding the microbiological characteristics, mainly faecal streptococci, and as to the chemical, physical and organoleptic characteristics, mainly the content and colour of dissolved oxygen exceeded the standards. As regards the microbiological characteristics, the quality of bathing water improved during the period from 1996 to 2004. The chemical quality of water has worsened to some extent.

Quality of bathing water - non-satisfying results of bathing water samples (according to the data of the Health Protection Inspectorate)



Indicator: Chlorophyll in marine waters

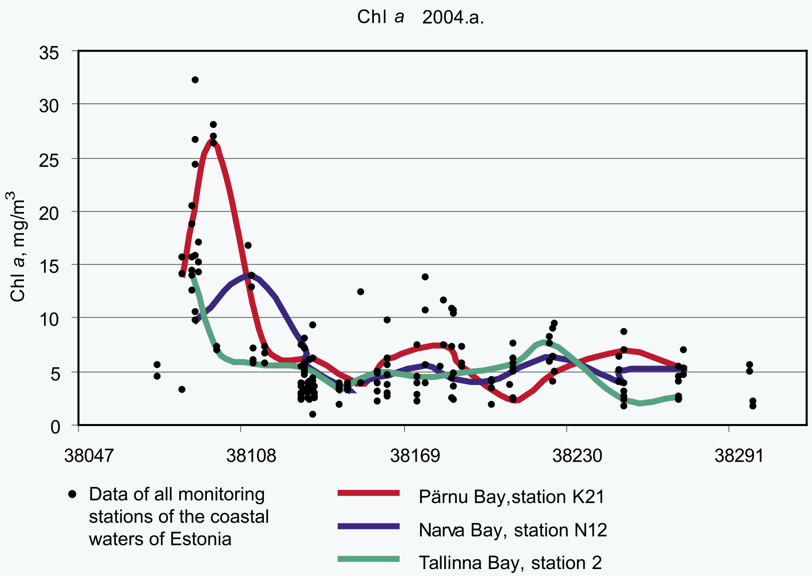
Target: obtaining a good status of water bodies by 2015 and the preservation thereof ➲.

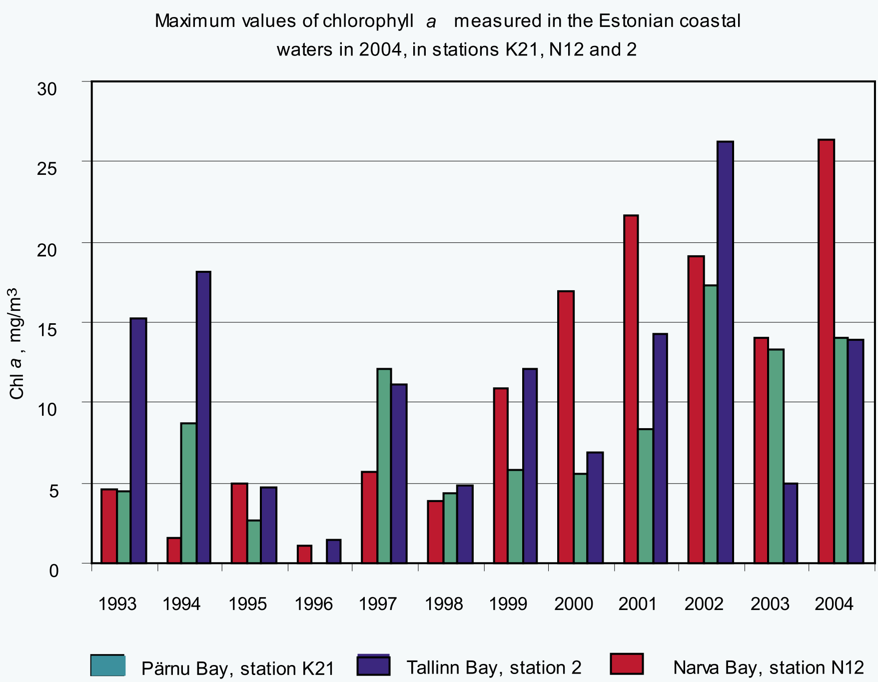
➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

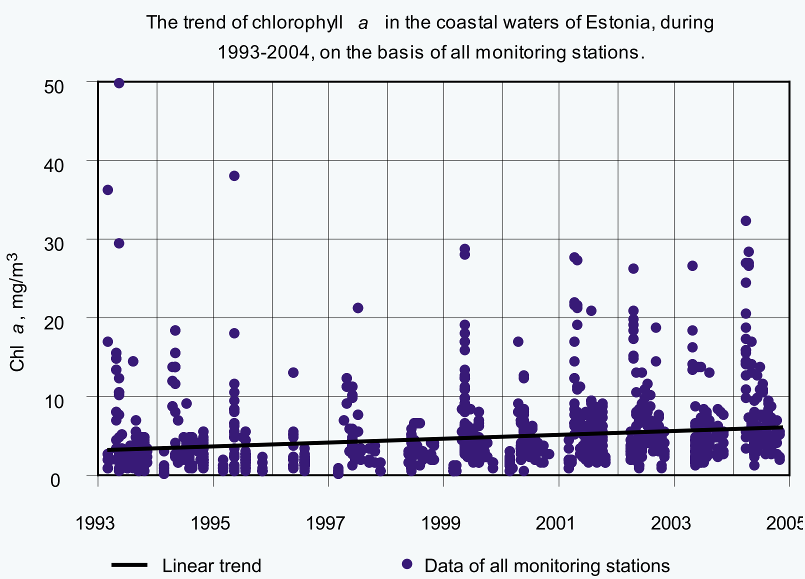
The mesurement results of chlorophyll a in 2004 characterise the extent of the biomass and the timely process of phytoplankton, generalised on the basis of all the monitoring stations of the coastal waters of Estonia included in the state monitoring programme. The spring maximum of the biomass of phytoplankton, which falls in the period between the month of April and the beginning of May in the coastal waters of Estonia, is intrinsic of the region.

The maximum concentrations of chlorophyll *a*, measured in the Pärnu Bay, the Tallinn Bay and the Narva Bay by years during the period of 1993–2004 is shown on the figures. There are less measurement results concerning 1996, which probably explains the lower maximum concentrations of that year. Considering the measurement results of all monitoring stations, the trend of chlorophyll *a* in the coastal waters of Estonia during 1993–2004 is shown on the figures.

Concentrations of chlorophyll *a*, measured in the coastal waters of Estonia, compared to the data of the Gulf of Finland and other regions of the Baltic Sea, are in an approximately equal magnitude, 5–6 mg/m^3 on average. When considering the time-related changes regarding the concentrations of chlorophyll *a*, it is possible to observe increasing as well as decreasing trends – both comprising approximately 7% of measuring stations – in the whole Baltic Sea over the last decade. The concentrations of chlorophyll *a* have remained on approximately the same level in most monitoring stations of the Baltic Sea, including the coastal waters of Estonia during the last decade.




Maximum values of chlorophyll a measured in the Estonian coastal waters in 2004, in stations K21, N12 and 2
Chl a , mg/m3
30
25
20
15
10
5
0
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Pärnu Bay, station K21
Tallinn Bay, station 2
Narva Bay, station N12


The trend of chlorophyll a in the coastal waters of Estonia, during 1993-2004, on the basis of all monitoring stations.
Chl a , mg/m3
50
40
30
20
10
0
1993
1995
1997
1999
2001
2003
2005
Linear trend
Data of all monitoring stations

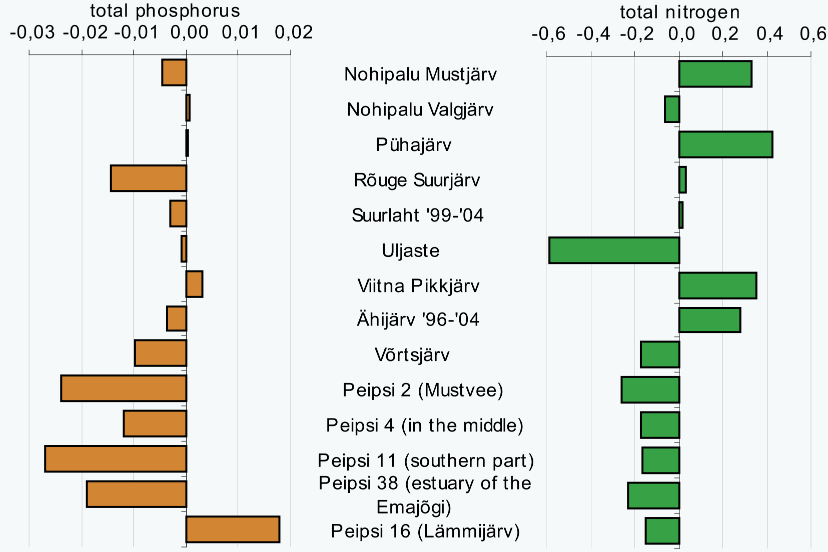
Lakes

Target: obtaining a good status of water bodies by 2015 and the preservation thereof ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

In Estonia, similarly to the whole Europe, eutrophication in lakes has decreased. The content of phosphorus has decreased and the percentage of lakes with high phosphorus content has also decreased. 23 small lakes, Lake Peipsi and Lake Võrtsjärv were under state monitoring in 2004. In general, the content of phosphorus in the monitored lakes is low. The content of phosphorus has increased only in two monitoring points – in Viitna Pikkjärv and Peipsi Lämmijärv. The latter is obviously affected by the pollution load coming from Russia, since in the other monitoring points of Lake Peipsi, a clear decrease in the content of phosphorus is observed.

The content of nitrogen is higher in Mullutu Suurlaht, in the estuary of the Emajõgi River, in Peipsi Lämmijärv and Võrtsjärv. Likewise, the content of nitrogen of the water layer near the bottom of Rõuge Suurjärv, the deepest lake in Estonia, is still higher. The situation has improved in several lakes and in all monitoring points of Lake Peipsi – this refers to the reduction of human activities (especially agricultural activities); in the case of Lake Peipsi, the completion of the construction of the new wastewater plant in Tartu has also been an important factor. The content of nitrogen of lakes used for recreational purposes has increased to a certain extent.



Rivers

Target: obtaining a good status of water bodies by 2015 and the preservation thereof ➲.
➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

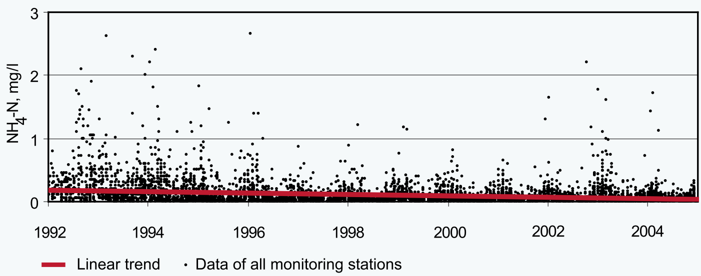
The measurement of the content of nutrients of river waters (nitrogen compounds and phosphorus compounds) enables to assess the diffuse pollution load originating from point sources and catchment areas. The content of nutrients is a factor, which affects the status of rivers through the growth of phytoplankton and phytobenthos during vegetation periods. Nutrients in the river, when carried into the sea, play an important role in the formation of the ecosystem.

The tendency of NH_4-N, total nitrogen and total phosphorus during the period in question expresses the decrease in the content of nutrients. As regards NH_4-N, the level of the consolidated data on rivers corresponds to the class of water "good" (0.1–0.3 mg NH_4-N/l), and as regards total nitrogen, it corresponds to the class of water "bad" (4.0–5.0 mgN/l). Regarding total phosphorus, it corresponds on the boundary of the classes of water "good" (0.08–0.12 mg P /l) and „bad" (0.12–0.16 mg P /l).

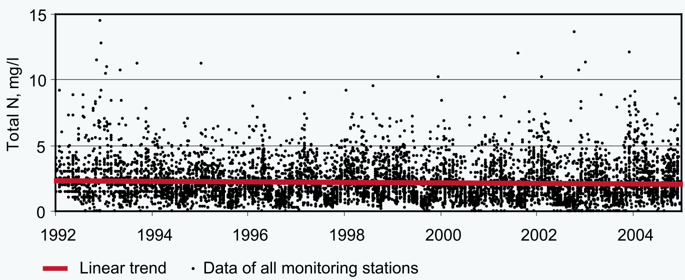
Based on the data collected in the course of the monitoring of the rivers of Estonia during 1992-2004, it may be admitted that the trends of BOD and nutrients have been falling. Such a tendency has been characteristic for the whole of EU region.

In the case of the rivers of Estonia, further attention must be paid to the reduction of the content of nitrogen compounds and phosphorus compounds. The values measured in the monitoring stations and the frequencies of the measurement results regarding NH_4-N, total nitrogen and total phosporus are specified on the following figures:

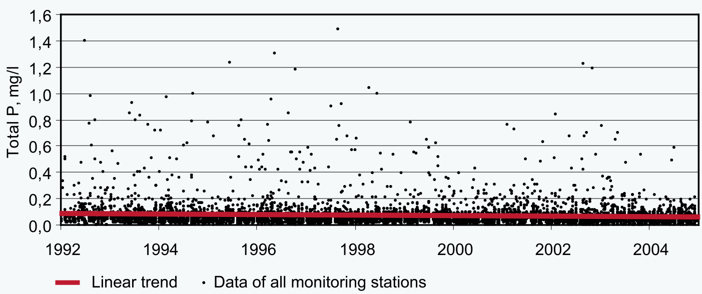
The tendency of NH_4-N in the rivers of Estonia during 1992-2004 according to the data of all monitoring stations



The tendency of total nitrogen in the rivers of Estonia during 1992-2004 according to the data of all monitoring stations



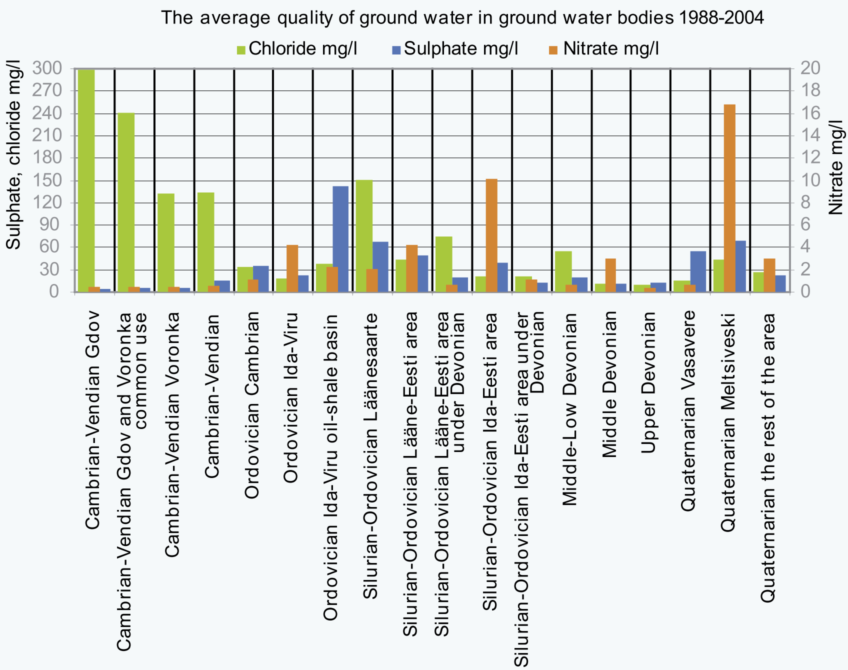
The tendency of total phosphorus in the rivers of Estonia, during 1992-2004, according to the data of all monitoring stations

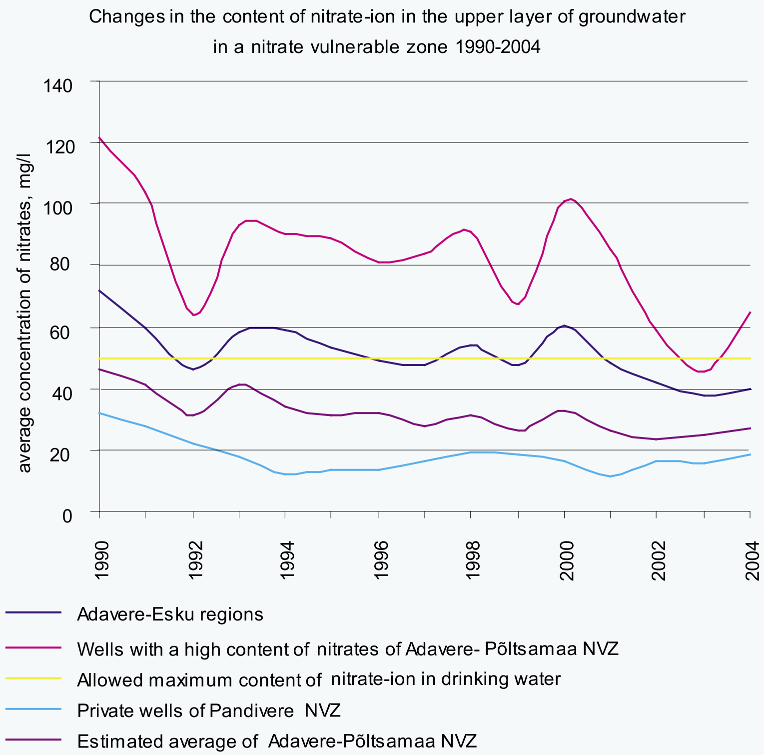


Target: obtaining a good status of water bodies by 2015 and the preservation thereof ➲.
➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

The qualitative status of the ground water of the Ordovician water complex in the Ida-Viru oil shale basin is poor due to an increased content of sulphates, minerality, hardness and the occurrence of hazardous substances (primarily phenols). Dewatering associated with the production of oil shale also has a relevant impact. The status of all other complexes and layers of ground water in Estonia is good.

Pursuant to the framework Directive on water policy and the Water Act, a nitrate vulnerable area (NVA), which is divided into the nitrate vulnerable areas of Pandivere and Adavere-Põltsamaa, has been distinguished in Estonia, with a view to protecting ground and surface water in the region associated with the agricultural production of Pandivere and Adavere-Põltsamaa; in the latter regions, agricultural activities have caused or may cause the content of nitrate-ion to exceed 50 mg/l in the ground water. The whole nitrate vulnerable area, sized 3250 km^2, forms approximately 7% of the total area of Estonia, whereas the included area of Pandivere covers 2382 km^2, the area of Adavere–Põltsamaa – 667 km^2 and the area of the intermediary zone (the Endla swamps) – 201 km^2. The quality of the ground water close to the soil of the NVA has significantly improved according to the content of nitrate-ion by today, in comparison with the beginning of the nineties. The improvement of the quality of water was more rapid immediately after Estonia gained independence; since then, the content of nitrate-ion in the ground water near the soil has been more or less stable: in the nitrate vulnerable area of Pandivere approximately 20 mg/l, according to estimations; in the nitrate vulnerable area of Adavere–Põltsamaa 30..35 mg/l (blue). The content of nitrate-ion is somewhat higher (nearly 50 mg/l, orange) in the water of the wells in the fields in the vicinity of Adavere and Esku, proceeding from intensive agricultural production and natural conditions. The water of some wells in this location is still not suitable for drinking (red). By implementing the measures specified in the activity plan of a nitrate vulnerable area (environmentally sound managing; rising the environmental awareness of producers and renovating-cleaning shallow water sources, including polluted water sources), it is possible that the quality of the ground water under the fields of Adavere and Esku vicinity will improve, regarding the content nitrate-ion.




Changes in the content of nitrate-ion in the upper layer of groundwater
in a nitrate vulnerable zone 1990-2004
average concentration of nitrates, mg/l
140
120
100
80
60
40
20
0
1990
1992
1994
1996
1998
2000
2002
2004
Adavere-Esku regions
Wells with a high content of nitrates of Adavere- Põltsamaa NVZ
Allowed maximum content of nitrate-ion in drinking water
Private wells of Pandivere NVZ
Estimated average of Adavere-Põltsamaa NVZ

Drinking water

Target: To ascertain the safety for health regarding the use of all ground water intakes and to ensure the purification of water being in non-compliance with the requirements for drinking; to ensure the conformity of the indicator parameters of drinking water to the requirements in settlements with 2000 or more inhabitants by the year 2008 (as regards the content of iron, pH and manganese – by 2007) and in settlements with less than 2000 inhabitants – by the year 2013 ➲.

➲ Estonia's Environment Strategy until 2010; www.envir.ee
Related policy documents - http://eur-lex.europa.eu

Compared to the year 2001, the quality of drinking water has improved to some extent with regard to microbiological characteristics and indicators. Due to measures taken and state supervision, no major incidences, caused by drinking water, have occurred over the last ten years. Microbiological and chemical characteristics refer to direct threat to health. With regard to chemical characteristics, Estonian drinking water failed to comply with the established requirements in 2.5% of the cases (in 2004). The biggest problem is an excessive content of fluor (over 1.5 mg/l), the level of which depends on the layer of utilised groundwater. As a rule, the groundwater, rich in fluor, contains also more boron. Indicators characterise the organoleptic qualities of water. Where exceeded, the conditions for the use of water and the quality of life worsens, but there is no direct threat to health. The main compounds, in the case of which the quality of drinking water often fails to comply with the requirements, are iron and sensory parameters associated with iron - manganese and ammonium. Due to measures taken, the indicators have also improved. During the last two years, a lot of innovations have taken place: drinking water purification plants and pipelines were built and renovated, and iron removal equipment was installed.

Number of inhabitants using substandard drinking water (%)

	2002	2003	2004
Non-conformity as regards microbiological characteristics (%)	0,02%	0,006%	0,004%
Non-conformity as regards chemical characteristics (%)	1,3%	2,3%	2,5%
Non-conformity as regards indicators (%)	35,3%	28%	29,6%

DOCUMENTATION PAGE

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Date	March 2007
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Theme of publication	Estonian environment
Abstract	This survey, Environmental Review 2005: an Indicator-Based Summary, is based on the report Environmental Review 2005. The report contains a selection of data from the full report Environmental review 2005. The data that best corresponds to the Core Set of Indicators (CSI), worked out by the European Environment Agency or other similar indicators, has been included in this summary. While the full version of Environmental Review 2005 is mainly targeted to the public, then the current summary aims to draw the attention of environmentalists outside Estonia. The environmental review reflects on environmental trends from 2000 (in some cases also from an earlier period) until 2004, depending on the issue.
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Väljaande sisu	Eesti keskkond
Kokkuvõte	Ingliskeelne väljaanne „Environmental Review 2005: an Indicator-Based Summary“ on kokkuvõte trükisest „Keskkonnaülevaade 2005“. Kokkuvõttesse on koondatud materjal, mis vastab Euroopa Keskkonnaagentuuri poolt välja töötatud peamistele keskkonnaindikaatoritele. Kokkuvõtte koostamisel on kasutatud materjali nii ülevaatest „Keskkonnaülevaade 2005“ kui ka Euroopa Keskkonnaagentuuri raportist „The European Environment: State and Outlook 2005“. Trükises käsitletakse selliseid keskkonnateemasid nagu kliimamuutused, õhk, vesi, jäätmed, kalandus ja looduslik mitmekesisus.
Märksõnad	Keskkond, sotsiaalmajanduslik areng, õhk, bioloogiline mitmekesisus, kliimamuutused, kalandus, jäätmed, vesi, indikaatorid
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