REPUBLIC OF ESTONIA

REFERENCE FRAMEWORK for the COHESION FUND 2004-2006 in ENVIRONMENT SECTOR

MINISTRY OF ENVIRONMENT

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1 INTRODUCTION

Estonia continues to make progress in undertaking a range of measures to comply with the *acquis communitaire*. In addition to the ongoing EU Phare and ISPA measures Estonia will get the opportunity to benefit from Cohesion Fund (CF) and structural funds support.

This document presents Estonia's Reference Framework (RF) for the CF in the environment sector and presents a selection of projects in the air quality, waste management, wastewater and drinking water sectors.

In the environment sector, RF for the CF 2004-2006 focuses on measures, which will enable Estonia to comply with the EU Accession Partnership and with the priorities indicated in the National Programme for the Adoption of the *Acquis* (NPAA). In particular RF for the CF focuses on substantive approximation with the most costly directives:

- Urban Waste Water Directive,
- Drinking Water Directive,
- Directive on surface water used for abstraction of drinking water,
- Dangerous Substances Directive,
- Nitrates directive,
- Water Framework Directive,
- Sewage Sludge Directive,
- Groundwater Directive,
- Large Combustion Plants Directive,
- National Emission Ceilings Directive,
- Air Quality Framework Directive and its Daughter Directives,
- Landfills Directive,
- Several other directives related to solid waste management and recycling,
- Habitats and Wild Birds Directive.
- Directive on the promotion of electricity produced from renewable energy sources in the electricity market.

RF for the CF is natural continuation of ISPA strategy what was developed in 1999 and updated on a yearly basis. In Estonia, the investments required for achievement of the provision of the EU environment directives fall mainly in the realm of the public sector (in particular the municipalities) and therefore

impose a heavy burden on public finances. The total estimated cost of full compliance with the environmental aspects of the *acquis* is estimated by experts to EUR 1,7 billion. (as of January 2001). According to the Conference on Accession to the European Union (CONF-EE 13/01, chapter 22, Brussels 30 May 2001) full compliance has to be achieved by 2013.

RF for the CF below is making reference to the transitional periods, related to compliance with EU Directives, requested by Estonia in its Position Paper.

Upon accession, Estonia will be entitled to receive assistance under the Cohesion Fund and Structural Funds. A 45% of total EU assistance to Estonia in 2004-2006 will be allocated to the Cohesion Fund, which essentially finances similar projects as under ISPA (following similar decision procedures). The Cohesion Fund Regulation broadens the scope of eligibility of measures in the environmental sector. The Cohesion Fund extends eligibility to projects that preserve, protect and improve the quality of the environment and the protection and health of citizens. This would allow to expand funding to projects in energy sector, for example for renewable energy projects. ISPA TA will be used for the preparation of sufficient number of high-quality projects for the Cohesion Fund. This is one of the most urgent tasks Estonia has to embark upon to ensure absorption of these funds that will become available upon accession. Estonian environmental sector projects will also receive some financial support from European Regional Development Fund (ERDF).

For Implementation of the EU Structural Funds Estonia elaborated „Estonian National Development Plan - Single Programming Document 2003-2006“. In accordance with this document, environmental sector is eligible for support from ERDF under priority 4 “Infrastructure and Local Development”, which has mostly a supportive nature. The role of the priority in the environment sector is to support the measures taken under the Cohesion Fund.

Under measure 4.2 „Development of Environmental Infrastructure“ the following specific objectives of the measure are pointed out:

- Achieving a good status of surface waters and groundwater
- Reducing the environmental impact of the energy sector, improving efficiency and increasing the share of renewable energy
- Prevention and reduction of waste production, together with the related health and environmental hazards
- Preservation of biological and landscape diversity.

However, the investments channelled to the environmental projects through ERDF are relatively small (10 MEUR compared to CF’s 150 MEUR).

Description of environmental activities supported by ERDF are given in SPD under the measure 4.2

2 OVERVIEW OF STATE OF THE ENVIRONMENT AND ENVIRONMENTAL INFRASTRUCTURE

2.1 General

Estonia is the most northerly of the Baltic States, bordered by Russia to the east and Latvia to the south. It has a population of 1,446 million people. The capital, Tallinn, with approximately 412 000 inhabitants, is a large Baltic Sea port. Other major towns are Tartu, Narva, Kohtla-Järve and Pärnu.

Estonia covers an area of 45 227 km². The country is relatively flat, and the highest point, Suur Munamägi, reaches 318 meters. Mean annual precipitation is 500 to 700 mm. In addition to two major lakes, Lake Peipsi (3 555 km², shared with Russia) and Võrtsjärv (266 km²), there are over 1 400 lakes which cover 6 per cent of the territory.

Extensive mineral resources include oil shale, phosphorite and limestone. About 30 per cent of the land is arable, the principal agricultural outputs being dairy products, meat and cereals. Forests cover 40 per cent of the territory while peatlands cover about 22 per cent (partly coinciding with forest areas). The Baltic Sea offers significant fisheries potential, but pollution and local eutrophication are causing increasing problems.

The most serious environmental problems in Estonia are air and water pollution, concentrated in the Tallinn region and the Northeast part of the country. They are mainly caused by the oil-shale burning power plants, chemical plants and cement factories and by municipal sewage pollution and agricultural runoff.

Gaps between Estonia and EU are mostly related to the quality and coverage of the municipal services to be provided to the people by environmental infrastructure as well as to quality of drinking and bathing waters and ambient air.

Estonian population lacks central municipal services compared as to EU. For example approximately 77% of the population is connected to the wastewater treatment system, while only 58% of treatment plants are working satisfactory and approximately 77% of the population is connected to the central water supply systems (in the bigger settlements, 80-95% of the population is connected).

RF for CF aims at significant reduction of these gaps and all environment infrastructure projects selected for co-financing are contributing towards implementation of the acquis.

2.2 Air Quality

Air pollution in Estonia is mainly caused by the stationary sources of electricity and heat producers. The implementation of EU legislation in these sectors is the biggest problem for Estonia as these installations mainly belong to the state or to municipalities and they do not have resources for the required investments. The only way to get resources for investment or repayment of loans for them would be the raising of the prices for electricity and heating energy, which would create economic difficulties for a wide group of energy consumers. This would lead to the rising of the prices in all economic sectors. Due to the above mentioned considerations the strategy focuses mainly on the air pollution problems connected with electricity and heat production.

The most important issue in Estonian energy sector is the usage of local fuel - oil shale. It is used for production of 90 % of the country's electricity, which is a unique case in the whole world. Oil shale has played an important role in formation of Estonian economy and the whole society. Huge oil shale fired electric power plants were set up, oil shale chemical industry was developed, and the new mining areas were taken into use. Estonian oil shale as a technological raw material has very unique characteristics: the processing of oil shale results in products which cannot be obtained by the processing of crude oil, coal and from the oil shale of other regions.

The amount of oil shale mining in quarries and mines has changed depending on demand of power stations and oil shale processing industry (in 1965 it was 16 million tons per year, in 1980 31 million tons per year, in 1990 23 million tons per year).

The peak of oil shale production was in 1980 when the Baltic and Estonian electric power plants (put into operation in 1965 and 1973 respectively) covered the need for power up to 20 TWh per year. 4 million tons of oil shale per year was used to produce generator gas.

The yearly production of oil shale was reduced by 8 million tons during ten years (1980-1990) due to the replacement of usage of oil shale gas to natural gas and due to the partly replacement of power needs by Sosnovõi Bor Nuclear Power Plant. In 1985 the production of oil shale had fallen to 25,7 million tons and in 1990 to 21,2 million tons.

During the next ten years the production of oil shale was reduced again (by 1999 it was 12 million tons less). This was caused by the reduction of export and electric power consumption on home market. By the end of 1998 the reduction was also influenced by the oil price on world market which had fallen even below 10 USD/barrel. The need for production of oil from oil shale

in Estonia decreased and this reduced the need for oil shale by 1 million tons per year.

Table 2.2.1: The dynamics of oil shale production and consumption										
	1997		**1998**		**1999**		**2000**		**2001**	
	PJ	**Million Tons**	**PJ**	**Million Tons**	**PJ**	**Million Tons**	**PJ**	**Million Tons**	**PJ**	**Million Tons**
Production amount	130,60	14,38	112,82	12,46	94,81	10,69	108,33	11,73	106,18	11,84
Import	12,73	1,53	10,90	1,32	11,12	1,36	10,96	1,37	9,47	1,18
Export	0,15	0,02	0,06	0,01	0,1	0,01	0,12	0,01	0,10	0,01
Changes in stocks	-0,55	-0,06	-1,07	-0,12	-5,76	-0,65	-1,28	-0,15	-2,52	-0,23
Consumed:	143,70	15,95	124,70	13,89	111,59	12,68	120,68	13,25	118,19	13,25
For electricity production	97,89	11,52	87,41	10,30	84,2	9,96	116,75	12,88	114,57	12,89
For heat generation	11,74	1,36	11,42	1,33	9,45	1,1	83,58	9,83	80,03	9,63
For oil and coke production	30,85	2,66	20,88	1,80	15,33	1,35	8,91	1,05	8,87	1,07
In chemical industry	-	-	-	-	-	-	-	-	-	-
Other	2,78	0,31	3,57	0,33	2,22	0,24	2,14	0,22	1,99	0,22
Source: Ministry of Economic Affairs and Communications										

The under-capacity operation of oil shale mines has raised the unit price for production of oil shale. The latter is also influenced by the need for investments in oil shale mines and rising of environmental charges, resource taxes and prices for manpower.

In 1998 the persistent (fixed) costs of oil shale production were 49 % from all costs and in 1999 they was even higher. It was planned to close two oil shale mines - Tammiku and Sompa, which had the persistent costs over 6,4 EUR per ton of oil shale. The number of working places was reduced in 1999 by 650 persons.

In 1999 new council and new board was elected to Eesti Põlevkivi Ltd. A new development plan for the period until 2015 was elaborated.

The main part of oil shale (84,2 PJ, i.e. more than 80 % of production is used as fuel) is consumed for electricity production, the remaining part for heat, oil

and coke production and as a raw material for chemical industry.

Below, an overview is given on the two main areas of oil shale usage, i.e. electricity and oil production.

1. Electric energy production.

Eesti Energia Ltd. belongs 100 % to the state. Eesti Energia Ltd. and its daughter companies are engaged in production of electric energy, its transmission and distribution but also the sales and export. Eesti Energia Ltd. has about 5400 employees.

2. Oil shale is used as a fuel for electricity production mainly in two power plants - Estonian and Baltic Power Plant. The designed capacity of power production in Estonian and Baltic Power Plants is 1610 and 1390 MW respectively. Both plants are condensation-type thermal power plants. In one of the installations in Baltic Power Plant electricity and heat are co-generated. Heat is used for district heating system of town of Narva. The efficiency of both plants is below 29% and the production requires too much manpower.

Estonian Power Plant and Baltic Power Plant are the economic units of Narva Elektrijaamad Ltd., which belongs 100 % to Eesti Energia Ltd.

In 2000 ca. 90,7 % and in 2001 ca. 90,0 % of electric energy was produced based on oil shale (see table 2.2.2). Smaller private companies produce electricity in hydroelectric and co-generation plants.

Table 2.2.2: Electric Energy Production and Balance (GWh)

Electricity GWh	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Total	8 690	9 100	9 217	8 518	8 263	8 510	8 481
Electric Energy Production							
Oil shale	8 299	8 576	8 778	7 961	7630	7 719	7636
Peat	-	-	11	17	16	19	20
Heavy fuel oil	25	66	136	224	223	2	2
Oil shale oil	40	36	41	33	67	32	38
Natural gas	325	418	121	171	210	560	566
Other fuels	1	4	127	108	114	172	211
Hydro-electric and wind energy	-	-	3	4	5	6	8
Electric energy balance							
Production	8 690	9 100	9 220	8 520	8263	8 513	2 484
Import	245	240	210	-140	138	258	269
Export	1 004	1 100	1 180	530	734	1 187	891
Consumption	5 074	5 420	5 580	5 580	5286	4 970	5 137
Own use by power plants	1 086	1 120	1 150	980	916	922	893

Losses	1 773	1 710	1 510	1 570	1470	1 240	1 361
Source: Ministry of Economic Affairs and Communications							

The main pollutants emitted into air from oil shale based power plants are sulphur dioxide and dust. The two power plants emit 77,8 % of sulphur dioxide and 94,1 % of dust from all Estonian stationary sources. Due to reduction of electricity export to Russia and Latvia and reduction of internal consumption the production of electricity has significantly decreased. The share of oil shale based power plants' emissions in the total amount of nitrogen oxides, carbon mono-oxide and volatile hydrocarbons is quite low and it decreases further due to the rise of emission amounts from transport sector.

Table 2.2.3: Sulphur dioxide emissions 1990-2001 (Thousand tons)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Mobile sources	13,1	12,7	8,2	8,8	8,1	8,3	8,0	8,0	9,2	9,4	1,3	
Stationary sources	239,0	233,0	179,2	145,0	141,1	110,3	117,2	111,0	100,9	94,6	91,5	87,4
Power plants	178,8	170,7	142,0	113,7	112,2	83,7	90,9	87,0	82,1	78,8	74,6	69,8
TOTAL	**252,1**	**245,7**	**187,4**	**153,8**	**149,2**	**118,6**	**125,2**	**119,0**	**110,1**	**104,0**	**95,5**	
Source: Estonian Environmental Information Centre												

Table 2.2.4: Dust emissions 1990-2001 (Thousand tons)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Stationary sources	268,5	277,8	240,8	189,0	161,5	113,1	98,9	78,3	69,9	70,5	59,5	56,4
Power plants	181,0	143,3	133,2	104,2	102,2	69,6	74,4	67,0	60,4	61,3	47,9	46,1
Source: Estonian Environmental Information Centre												

In 1994 Estonia ratified UN Climate Change Framework Convention which aim is to stabilise the emissions of greenhouse gases by year 2000 at the level of 1990. Kyoto protocol signed under the Convention foresees to decrease the emissions of greenhouse gases during the years 2008 -2012 by 5 % from the level of year 1990. Estonia committed itself alike European Union to reduce the emissions of greenhouse gases by 8 %.

Due to the reduction of the production capacities in Estonia the emissions of greenhouse gases have decreased almost two times compared with the year 1990. At the same time the emissions of greenhouse gases per inhabitant of Estonia are among of the ten highest in the world. The average carbon dioxide emission in the world is 0,6 tons per inhabitant while in 2001 this number in Estonia was 14,7 tons per inhabitant.

Table 2.2.5: Carbon dioxide emissions 1990-2000 (Thousand tons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fuel combustion	2 693	3 078	1 498	1 713	1 522	1 103	1 047	1 212	1 352	1 203	1 030
Stationary sources	35 414	32 837	24 644	18 840	19 856	18 212	19 217	19 013	16 965	15 568	15 819
Energy production	34 800	32 223	24 330	18 647	19 642	17 991	19 009	18 787	16 598	15 221	15 464
TOTAL	38 107	35 915	26 142	20 553	21 378	19 315	20 264	20 225	18 317	16 771	16 849

Source: Estonian Environmental Information Centre (on the base of the Institute of Ecology reports)

3. Production of oil from oil shale

An important part of the oil shale resource (21 - 31 PJ per year) goes for the production of oil (so called "oil shale oil") in the process of destructive distillation. There are two different technologies for production of oil shale oil. Estonian Power Plant uses the technology where it is possible to use the same oil shale that is used for energetical purposes (UTT-3000). In Kohtla-Järve and Kiviõli oil industries the high quality concentrate is required as a raw material. Table 2.2.6 gives the data on production and consumption of oil shale oil. About 50 % of the produced oil shale oil is exported and the rest is used on the domestic market.

Table 2.2.6: Production and Consumption of Oil Shale Oil (Thousand tons)

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Production	313	343	367	220	151	238	255
Export	148	184	211	92	60	123	127
Import	27	-	-	3	-	-	-
Consumption	195	157	159	112	129	108	126
Electricity production	11	10	10	10	14	9	9
Heat generation	154	96	96	100	96	99	116
Chemical industry	5	33	41	-	-	-	-

Source: Ministry of Economic Affairs and Communications

Resulting from the oil production during 50 years about 70 Mt of semi-coke in

Kohtla-Järve and 15 Mt of semi-coke in Kiviõli has been storaged. Every year about 0,7 Mt in Kohtla-Järve and 0,2 Mt in Kiviõli is additionally storaged.

Environmental impact of semi-coke is connected with its content of organic compounds in oil-shale oil waste, the most negative impact of which have phenols and PAH's. The dry oil-shale semi-coke mineral part (90 %) does not have any significant environmental effect.

The distillation unit on the territory of Estonian Power Plant (previously UTT-3000) produced 76 000 tons of oil shale oil and 5 000 tons of oil shale bitumen in 1999. 543 000 tons of oil shale was used as raw material. In addition to oil shale 7 000 tons of crushed tyres and 2 000 tons of waste oil was used in the unit. The production of oil resulted in 217 000 tons of ash, 112 tons of sulphur dioxide, 198 tons of dust, 520 000 tons of carbon dioxide 590 tons of hydrocarbons (mainly methane). In year 2000 307 277 tons of solid waste was storaged.

In general the emissions from stationary sources are decreasing. In year 2000 emissions to air from stationary sources in Estonia included: 91,492 t sulphur dioxide (SO2); 15,342 t nitrogen oxides (NOx); 59,486 t particulates (solids); and 7,559 t volatile organic compounds (VOCs). As can be seen from Table 2.2.7, there has been a general downward trend in air pollution from stationary sources since 1992 (with the exception of nitrogen oxides and carbon monoxide).

Decrease of SO2 emissions took place mainly due to the decrease of load of large power stations (North-East Estonia) as well as reduction of amounts of heavy fuel oil used for combustion in boilers. Decrease of particulates emissions was the resulted by new purification equipment in the enterprise of cement production and in the two largest (Baltic and Estonian) Power Plants.

The increase in SO2 and NOx between 1995-1996 was due to increased energy production by the Baltic, Kohtla-Järve, Ahtme and Iru Power Plants and the increasing sulphur content of the fuels used in the Baltic Power Plant.

Table 2.2.7: Emissions from stationary sources 1980-2001 (Thousand tons)

Year	NOx	SO2	CO	PM	VOCs
1980	-	274,8	-	-	-
1987	28,4	-	-	-	-
1990	22,6	239,0	59,9	268,5	18,0
1992	15,0	179,2	32,5	240,8	11,2
1993	12,1	145,0	27,8	189,0	5,7
1994	14,6	141, 1	31,8	161,5	4,8
1995	14,9	110,3	27,3	113,1	6,5

1996	16,3	117,3	29,4	98,9	5,7
1997	15,6	111,0	26,7	78,3	6,3
1998	14,9	100,9	26,4	69,9	5,7
1999	14,5	94,69	20,9	70,5	5,1
2000	15,3	91,5	19,4	59,5	7,6
2001	16,2	87,4	21,3	56,4	8,6
Source: Estonian Environmental Information Centre					

In 2000 the main polluters of SO2 and particulates - 92,4% and 88,2% correspondingly - were large enterprises of energy and heat production, building materials and oil-shale chemistry. Most of these enterprises are located in North-East Estonia.

The dominating emissions from oil-shale based thermal power plants are sulphur dioxide and particulates. Power plants emit 83,3 % and 87 % respectively, of these emissions from stationary sources as well 77 % from total of these emissions in Estonia (Environment 2000, Statistical Office of Estonia). Mainly due to a decrease in export to the Russian Federation and Latvia, and a decrease in domestic demand, a significant decrease in the production of electricity from the large oil shale burning power plants in Narva has taken place in recent years. The percentage contribution by the oil shale power plants to other emissions - such as nitrogen oxides, carbon monoxide and hydrocarbons - is smaller and decreasing because of the rapidly increasing emissions from the transport sector. The growing number and use of cars is the main source for air pollution in towns. The number of cars has increased about three times compared to 1980, at the same time the infrastructure of roads in towns has remained mainly unchanged. The average age of cars in Estonia - 13years - is higher then in EU countries. Older cars, which are not technically in order, emit more harmful compounds. The share of public transport in the passenger traffic volume in 2000 has decreased more then two times compared to 1990.

Greenhouse gases (sulphur dioxide, methane, freons and dinitrogen oxide) cause accumulation of the solar energy reflected from the surface, into the atmosphere, thus causing climate change. Estonia has ratified the United Nations framework Convention on Climate Change in 1994, which has set the aims to stabilise greenhouse gases emissions on the level of 1990 for the year 2000. Kyoto protoco (Estonia signed 1997), foresees to reduce greenhouse gases emissions by 5% for the years 2008-2012 from the 1990 level. Estonia together with European Union committed to reduce greenhouse gas emissions by 8%.

Mainly due to the reduction of industrial production, Estonia has reduced its

greenhouse gases emissions bit less then half compared to 1990 . At the same time Estonia is among ten biggest emitters of carbon dioxide per capita in the world. If world average emission of carbon dioxide per capita is 0.6 tons, then Estonia emitted 14.7tons of carbon dioxide per capita in 1996. Oil-shale usage contributes 72% from total CO2 emissions.

Estonian National Environmental Strategy has set an aim to reduce negative environmental impact of energy sector, to orientate the energy policy on the technological development and use of renewable resources, to reduce the gene-ration of the greenhouse gases and to internalise the external costs of the energy production and consumption into the price of energy.

Estonian Environmental Strategy foresees for the year 2000 stabilisation of NOx emissions for the level of 1987 and take measures for future reductions, to control compliance of exhaust gases of vehicles to limit values and to strengthen the quality requirements for imported and existing cars; to reduce levels of VOC emissions by 50% compared to year 1990, to reduce use of the leaded gasoline by 80% compared to consumption of 1995.

NES has set the goal to achieve consistency of air quality with EU standards for 2005, to reduce the emission of sulphuric compounds by 80% from the level of 1980-ies, to reduce of solid particles by 25% compared with the level of 1995, to finish the leaded gasoline and the use of diesel fuel with more than 0.05% of sulphur content.

The main problems in the air sector in Estonia are connected with energy production (Table 2.2.8). High amounts of SO2 come from the energy sector (95% of electricity is produced by two oil shale based thermal power plants in North-East Estonia). The reconstruction of the energy sector requires considerable investment.

Table 2.2.8: Main Sources of Air Pollution, 2000 (Thousand tons) (+/- compared with 1995)

Entity	**Solid**	**+/-**	**SO2**	**+/-**	**NOx**	**+/-**	**CO**	**+/-**	**VOC**	**+/-**
Estonian Power Plant	25,8	-8,2	41,5	-0,3	5,7	-0,4	8,1	-0,4	1,1	0,7
Baltic Power Plant	21,5	-12,8	27,3	-5,2	3,1	-0,4	0	0	0	0
Kunda-Nordic Cement Ltd	0,5	-34,1	0,8	-1,9	1,5	1	0,7	0,7	0	0
Viru Keemia Grupp Ltd[1]	0,1	0	6,1	1,4	0,01	-0,1	0,2	-0,1	1,1	-2,5

Kohtla-Järve Power Plant	0,1	-0,2	3,6	1	0,2	0	0	0	0	0
Kiviõli Keemiatööstuse Ltd.	0,4	-0,1	1,9	-0,9	0,03	0	0,4	-0,8	0,04	-0,2
Ahtme Power Plant	0,3	-0,7	2	-0,5	0,2	0	0	0	0	0
Sillamäe Power Plant	0,7	-0,9	1,4	-0,3	0,1	-0,2	0,2	-0,8	0	0
Iru Power Plant	0	0	0	-2	1,1	0,8	0,05	0,05	0	0
Source: Estonian Environment Information Centre 2001										

1 - including Viru Energia Ltd

The dominant emissions are SO2 and particulates (solids) from oil-shale combustion plants. The two biggest oil-shale power plants produce more than 75,2% and 79,5% of total emissions respectively. A significant decrease in the production of electricity from the large oil-shale burning power plants in Narva has taken place in recent years, mainly due to a decrease in export to the Russian Federation and Latvia, and to decrease in domestic demand.

The relative contribution by the oil-shale power plants to other emissions - such as NOx, CO and hydrocarbons (CxHy) - is smaller and decreasing because of the rapidly increasing emissions from the transport sector.

Approximately 75% of the main air pollutants come from North-East Estonia, in particular from the Baltic and Estonian Thermal Power Plants (oil shale burning), Kunda Nordic Cement Plant and several smaller power plants, oil-shale processing and chemical industries.

Enterprises that have large combustion plants and have to fulfil the above obligations can roughly be divided into three groups:

- Power plants (at Narva, Kohtla-Järve and Iru),
- Large boiler houses ensuring for regional production of heat in towns (in Tallinn, Tartu, Pärnu, Kunda),
- Industrial combined heat and power plants (at Sillamäe, Kehra).

Implementation of EU Directive on Large Combustion Plants and the Regulation of the Minister of Environment of 26 October 1998 No. 60 is performed through on *Establishment of the Limit Values for Emissions of Pollutants from Large Combustion Plants per Capacity Unit of Gases.* A new Regulation on emission limit values will be elaborated and established on the basis of the new LCP Directive 2001/80/EC.

Table 2.2.9: Large Combustion Plants,		
County/ Enterprise	**Type of Boilers**	**Nominal power, MWth**
Ida-Virumaa/Ahtme	Bukkau, BKZ75-39	268

Ida-Virumaa/ Fortum Termest	E75-40G	131
Tallinn/ Tallinna Küte	PTVM-100 and 50, KVGM-100	1046.9
Tartumaa/ Anne Soojus	PTVM-50	58
Harjumaa/ Iru PP	TGME-464, KVGM-100	1044
Ida-Virumaa/ Eesti PP	TP-101	3100
Ida-Virumaa/Balti PP	TP-17, TP-67	1570
Ida-Virumaa/ Kohtla-Järve PP	BKZ75-39	268

In conformity with the Governmental Order on the *Approval of National Programme on Reduction of Emissions of Pollutants from Large Combustion Plants,* the main financing sources are the enterprises.

Regarding air protection, the responsibility of carrying out monitoring and research is laid on Environmental Research Centre (EERC). The EERC is responsible for providing relevant information to other institutions, supervising the work of other environmental laboratories and assure an accreditation and certification system of the latter. The EERC has one laboratory in Tallinn and one in Rapla. With regard to air pollution control, it operates three air pollution monitoring stations in Tallinn, three background measuring stations in other areas of Estonia (Vilsandi, Palmse and Saarejärve) and two industrial pollution measuring stations in Kohtla-Järve and Narva.

In addition to EERC, the three regional Environmental Laboratories (EL) - South-Estonian EL (in Tartu), Virumaa EL (in Jõhvi) and Pärnu EL - are involved in monitoring activities.

There are also monitoring stations that belong to the installations - in Muuga port there is 1 station and near Kunda Cement Plant there are 3 stations.

In the years 2003-2006 the following project applications in air sector will be prepared:

- Air Pollution Reduction - Tallinna Soojus. Estimated cost: 10,4 MEUR,
- Renovation of Estonian Power Plant 3rd block. Estimated cost: 128 MEUR,
- Air Pollution Reduction, Ahtme CHP Repowering. Estimated cost: 45 MEUR,
- Reduction of Nox emissions form Iru CHP. Estimated cost: 5,1 MEUR,
- Renewable energy - wind generators. Estimated cost: 48 MEUR.

2.3 Water Resources & Water Supply

There are over 7 000 water courses in Estonia, but only 420 rivers are longer than 10 km and only 10 longer than 100 km (the longest is Võhandu River - 162 km). The majority of Estonian rivers are small and therefore sensitive to pollution.

Estonian rivers are divided into four watersheds:

- Narva-Peipsi basin,
- Gulf of Finland basin,
- Gulf of Riga basin,
- Islands.

The annual runoff of rivers is 270-290 mm^3 (11.7 km^3) and this is directed as follows:

- 23% runs to the Gulf of Finland,
- 43.6% to the Gulf of Riga,
- 33% to the Narva-Peipsi basin,
- 0.3% to Latvia and Russia.

The majority of Estonian water bodies (rivers, lakes, and coastal sea) are shallow and sensitive to pollution. As a result of the pollution, which was constantly increasing until 1992, the eutrophication is one of the priority problems. Discharges from sewage wastewater treatment plants and factories, leaching of agrochemicals and fertilisers applied to the soil in the past, leakage of chemicals from waste dumps and atmospheric deposition as a result of emissions from traffic and power generation have contributed to the nutrient enrichment of the aquatic ecosystem.

Water is abstracted for:

- Cooling water for energy generation,
- Public supply,
- Industrial production,
- Agricultural activities,
- Mining activities.

Water is abstracted from rivers and lakes and from different groundwater layers. A decrease in the level of industrial production has resulted in the decrease of water use. In addition, increased water prices and more accurate measurement of usage have encouraged industry and domestic users to save

water.

A total of 1 494 million m^3 of water were pumped from water bodies and groundwater during 2001, 48% less than in 1992. Total abstraction of water in Estonia is relatively high due to the use of cooling water (surface water) in energy production, and water for mining and fish farming. In 2001 cooling water accounted for 87% of total water consumption (1 104 million m^3).

Estonia's drinking water supply is based on:

- Groundwater (all rural settlements and most towns - 65% of population),
- Surface water (two large towns - 35% of population).

Surface water is purified and disinfected before use. Groundwater is generally used without treatment.

The main threats to water quality are major point sources (towns with population equivalent greater than 2000 and settlements in groundwater vulnerable areas including karst areas, inadequate landfill sites, industrial plants, particularly in the north-east) and diffuse sources (agriculture and atmospheric deposition).

As a consequence of intensive industrial and agricultural activity, the quality of Estonia's groundwater has decreased considerably due to pollution of the upper aquifers by nitrates (NO3). The natural NO3 concentration in Estonian groundwater should be 1-3 mg/l, but in reality about half of Estonia has a concentration of at least 10-30 mg/l. Aquifers are the most affected in South Estonia (Silur Ordovician). Groundwater is also threatened by pesticides, past pollution, deterioration of sewage treatment systems, etc. In North-East Estonia (an oil shale mining area), serious problems are caused by sulphate (SO4) contamination. Mining results in a lowering of the water table and an increase of SO4 concentration in groundwater up to 500 mg/l (compared with normal levels of 20 mg/l). Further more, the natural characteristics of groundwater particularly in the southern part of Estonia do not comply with the requirements of the drinking water directive due to the naturally high concentrations of iron, manganese, sulphates and chlorides in the groundwater. Recent study shows that also in certain areas of Estonia, particularly in Pärnu and Tartu County there is still high level of fluoride in the drinking water. The average concentration of iron in groundwater abstracted for the use of drinking water is approximately 8-14 mg/l.

In the short term, the remaining point sources of pollution (inadequate waste dumps, historic pollution sites, etc.) need to be remedied.

Another source of water pollution is oil shale extraction and burning in the

northern part of the country, which leads to SOx emissions and acid deposition. Mining waters (approximately 200 million m^3 annually) are treated only mechanically, also pumping out huge amounts from ordovician ground-water causes depression of ground-water level and quicker transportation of pollution by rainwater to the ground.

As regards surface waters, in recent years Estonia has achieved improvement of the chemical quality of its surface water bodies. However, less effort have been made to achieve good quality of the structure and functioning of aquatic ecosystems associated with surface waters. Therefore, CF project to improve the ecological status of Estonian inland water bodies in order to prevent their further deterioration and maintain and improve the status of aquatic ecosystems is under preparation. The project will also enable to provide economic benefits by contributing towards the protection of fish populations (including coastal fish populations), and to contribute to the control of the respective problems related to transboundary water bodies.

Ground and surface water pollution due to the over-use and environmentally damaging application of agricultural additives has also been a serious problem. However, this has eased temporarily due to increased fertiliser prices but is likely to return with overall economic growth. Other serious environmental damage has been caused in the past by the activities of the former Soviet army, and by the excessive exploitation of mineral resources.

Estonia's water supply systems are, in general, unsatisfactory. This is evident in the large extent of water losses (due to leakage), approximately 30-35%.

There are 23 water treatment plants in Estonia, most of which are inefficient and worn out. However, there are exceptions, mainly treatment plants which have been recently reconstructed (e.g. Tallinn, Kuressaare, Tartu). Currently, there is a need for water treatment plants to be built or reconstructed in more than 20 towns and settlements. Approximately 77% of the population is connected to the central water supply systems in Estonia. In the bigger settlements, 80-95% of the population is connected to centralised water supply systems. However, Estonia faces a number of serious problems in the quality of its drinking water supplies and the water supply systems are, in general, unsatisfactory.

The total length of the water supply network of Estonia is about 3 100 km (25% of the network covers Tallinn). Most pipes are normally made of steel and cast iron and need reconstruction. Due to poor network conditions, leakage is high, in some places (north-east Estonia) up to 60 per cent. Large parts of the distribution system are dilapidated and losses from leakage lead to excessive abstractions in order to maintain supply. These abstractions in

turn can lead to lowering of the water table and to deterioration in groundwater quality. In the coastal area, they can give rise to saline intrusion. This situation contributes to the unsustainable use of water resources in some areas.

Approximately 1 700 wells and water bodies used for communal water supply come under the supervision of the Health Protection Services. Of this total, 173 wells (10%) do not meet health protection requirements. Over 2 400 private water supply sources have been registered, of which 31% do not meet health protection requirements.

In 1994, there were three incidences of contagious drinking water related diseases in Estonia. In 1995, this figure had fallen to one incident and by 1996, to zero. Three main problems affect drinking water in Estonia:

- In several areas the quality of raw water abstracted from surface and/or groundwater sources for drinking water does not achieve Estonian drinking water standards (which are based on EU standards);
- Pollution of groundwater with either oil products or nitrates;
- Decline of water supply systems and a lack of drinking water treatment in several places.

In order to transpose the water quality indicators to the EU requirements, considerable investments are necessary for renovation and reconstruction of drinking water systems in Estonia. The Ministry of the Environment has developed a plan for improvement of water facilities. According to the plan, approximately EUR 268 million should be invested in water supply systems between 2000 and 2013. From the year 2004 these projects will continue as the Cohesion Fund projects.

The plan gives priority to the following issues in 67 larger settlements:

- Reconstruction of 500 km of water supply pipelines,
- Renovation of 900 km of water supply pipelines,
- Renovation and/or reconstruction of 60 pumping stations,
- Reconstruction of 50 treatment plants or water treatment equipment,
- Renovation of 130 bore wells.

2.4 Wastewater

The water pollution load in Estonia has been decreasing since 1992 due to a decrease in discharges (related to reduction of industrial output) and an

increase in treatment efficiency (Table 2.4.1). New wastewater treatment plants in Tallinn, Tartu, Haapsalu, Rapla, Kuressaare, Keila, Jõgeva and Tapa and in several smaller settlements were constructed between 1992 and 2002.

Table 2.4.1: Pollution Load From Point Sources (Tons)										
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
BOD7	18 080	11 250	5 710	4 480	4 174	3 838	3 122	2 308	2 051	1 674
Ptot	673	445	353	321	304	303	279	256	230	193
Ntot	5 635	4 240	3 610	3 500	3 200	3 173	2 976	2 739	2 810	3 148
Sulphate	102 061	107 550	87 840	92 940	64 650	85 225	85 724	93 722	83 032	96 242
Chlorides	14 588	12 830	13 880	14 000	10 550	12 011	8 432	7 082	6 281	8 745
Source: Estonian Environment Information Centre, 2002.										

In 2001, the total discharge of wastewater was 1 497 million m3. However, cooling water from energy production, which does not require treatment, accounted for 80% of the total. Of the 292 million m3 of wastewater that did require treatment, 8 million m3 (2,7%) (Table 2.4.2) was discharged untreated.

Table 2.4.2: Wastewater Discharge (Million m^3/year)										
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Wastewater Requiring Treatment - of which:	453	393	378	396	316	349	327	312	282	305
Not Treated	26	23	19	18	15	10	8	6.8	7.5	7,5
Mechanical Treatment	203	188	186	203	138	184	172	171	152	177
Mechanical-Chemical Treatment	113	82	1	1	1	1	1	0.7	0	0
Biological Treatment	112	86	87	89	85	82	73	64	58	57
Biological-Chemical Treatment		13	84	85	77	72	73	69	64	64
Source: Estonian Environment Information Centre, 2002										

The situation regarding the discharge of untreated wastewater is serious in North-East Estonia where the cities of Kohtla-Järve and Narva are the two main sources of wastewater pollution.

In Estonia, industrial and domestic wastewater is usually treated together in municipal wastewater treatment plants.

At the end of 2001 there were 856 wastewater treatment plants in Estonia: 810 of them were small (less than 200 m^3/d), 34 medium (200-2 000 m^3/d) and 12 large (more than 2 000 m^3/d). About 120 wastewater treatment plants have been closed down since 1997 due to decreased agricultural and industrial production. Approximately 58% of treatment plants are working satisfactory. The main concern with wastewater management is that there is no systematic approach to handle sewage sludge, which is mainly discharged into wastewater treatment polishing ponds, river flood plains, surface water, or landfills. In addition, Estonia will need considerable investments to provide tertiary treatment (physico-chemical treatment for phosphate and nitrogen removal) to all sensitive areas.

The total length of sewerage in Estonia is approximately 3 280 km. About 77 % of the Estonian population is connected to a public sewerage system, but significant efforts are still needed to develop municipal wastewater infrastructure in rural areas.

The wastewater transmission systems are generally old and need rehabilitation or replacement. The pipelines are made of steel or cast iron and are heavily corroded. Consequently, wastewater leakage rates into the soil and storm water infiltration rates into the sewerage are both high. The leakage rates of wastewater from the wastewater system are in general 30% - 35%, in the North-East of the Estonia this figure reaches 60%.

The Ministry of the Environment has developed a plan for improvement of wastewater facilities. According to the plan, approximately EUR 320 million should be invested in sewage systems between 2000 and 2010. From the year 2004 these projects will continue as the Cohesion Fund projects. The plan gives priority to the following activities:

- Construction of new and upgrading of existing sewerage networks.
- Construction of new and upgrading of existing wastewater treatment plants in accordance with the set secondary treatment (which includes nutrients removal).
- Construction of tertiary treatment plants in sensitive areas.

Within the framework of the plan for improving water and wastewater facilities several project applications including applications for project implementation assistance have been composed and submitted to be financed under the ISPA financial instrument beginning from 2000. These projects are addressed to improve the wastewater facilities in settlements with pollution

load more than 2000 p.e. and to improve drinking water supply in settlements of more than 2000 inhabitants.

For implementing *acquis* in the water sector river basin management approach will be applied to compose CF projects. There is an intention to compose CF project for each sub-basin. Several projects to be implemented by the means of CF are under preparation. As the each sub-river basin district cover large areas it is in some cases ineffective to combine all the different measures necessary to implement into a one project. Therefore, the composition of more than one project in some sub-river basin has been considered reasonable. Projects under the preparation are following:

- East-Harju water management and Keila-Vasalemma river basin water projects in Harju sub-river basin district. Estimated cost: East-Harju Water Management 13 MEUR, Keila-Vasalemma River Basins Water Protection 7,6 MEUR;
- Pärnu river basin water management, expansion and rehabilitation of Pärnu sewage networks and Paide water network and sewerage projects in Pärnu sub-river basin district. Estimated cost: Pärnu river basin water management 14 MEUR, Expansion and rehabilitation of Pärnu sewage networks 12 MEUR, Paide water network and sewerage 7,13 MEUR;
- Emajõgi and Võhandu catchment area water management and Sillamäe and Narva-Jõesuu wastewater projects in Peipsi sub-river basin district. Estimated cost: Emajõgi and Võhandu catchment area water management 12 MEUR, Sillamäe and Narva-Jõesuu wastewater project 5 MEUR;
- Pandivere and Adavere-Põltsamaa water and wastewater project in Pandivere groundwater sub-river basin district. Estimated cost: 6,4 MEUR;
- Islands water management project in Läänesaarte sub-river basin district. Estimated cost: 10 MEUR;
- West-Viru water management in Viru sub-river basin district. Estimated cost: 18,85 MEUR.

2.5 Waste

Total waste generation in Estonia has been steadily declining since 1992 (Table 2.5.1). However, the trend is still unstable with a dramatic increase in domestic and other waste production in 1994-1996. This was due to rapid economic growth during this period, which led to an increase in consumer consumption and an increase in the generation of domestic or municipal waste.

Table 2.5.1: Waste Generation, 1992-2001 (Thousand tons)						
Year	**Total***	**Animal / Vegetable Origin**	**Inorganic Waste**	**Chemicals and Chemical Products**	**Other Waste**	**Domestic Waste**
1992	15 230	1 139	12 866	920	…	306
1993	14 512	575	12 366	1 263	…	309
1994	14 159	629	11 553	1 284	…	694
1995	14 613	1 443	10 955	1 266	416	533
1996	15 191	942	11 899	1 325	460	565
1997	14 918	821	11 923	1 383	198	593
1998	13 488	959	10 773	1 003	196	557
1999	11 347	845	8 903	644	386	569
2000	11 616	374	9 132	1 015	551	544
2001	12 839	309	8 940	1 122	1 987	481
Source: Estonian Environment Information Centre (2002)						

Packaging waste played a substantial role in this growth of domestic waste generation, due to the introduction of new packaging materials at the Estonian market. It is no surprise therefore that reduction of generation of packaging waste, and promotion of its re-use and recovery, are among the main targets in relation to municipal waste. One of the economic incentives designed to regulate the above-mentioned processes is the taxation of non-recovered packaging with excise tax. The Packaging Act, which establishes the schemes of taxation, was approved by Estonian Parliament at the end of 1996. The Act was designed to have a strong impact on the amount of waste generation through the re-use, recycling and return of waste.

The degree of hazardousness should also be considered when examining the production of waste in Estonia. Five classifications have been developed ranging from I to IV (and inert) with I being the most hazardous(Table 2.5.2).

Table 2.5.2: Waste Generation According to Hazardousness (Tons)						
Hazardousness	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
I	33	78	44	75	37	52
II	10 126	11 837	9 988	22 470	14 892	6 664
III	1 508 822	1 452 476	1 531 796	1 581 429	1 225 274	614 467
IV	5 956 595	5 808 963	6 137 042	5 756 856	5 031 456	5 238 338
Inert	6 342 741	6 132 619	7 007 854	7 037 266	6 712 560	4 988 468
Total	13 818 317	13 405 973	14 686 724	14 398 096	12 984 219	10 847 989
Source: State of the Environment Report (2000)						

"European waste classifier" has been introduced in Estonia since 1999, "Estonian waste classifier"(hazardous waste divided into 4 categories) is not valid any more. For proper comparison the data for 1999 and 2000 are given according to both standards (Table 2.5.2 and 2.5.3).

Table 2.5.3: Waste Generation According to European Waste Classifier*			
	1999	**2000**	**2001**
Common waste Hazardous Waste	5 229 017 5 618 972	5 650 099 5 965 750	6 632 752 6 206 013
Total	10 847 989	11 615 849	12 838 765

* "2000-2001 Review by List of Waste Categories" uses list of Waste Types and Hazardous Wastes (EJL), which is based on the European waste register. ELJ is approved by regulation of the Government of Estonia on the 24 of November 1998, No. 263.

The main (around 95% of total) sources of waste in Estonia are oil shale mining, oil shale chemistry and power production. Most wastes emerging from the production of oil shale energy and chemical industry belong to the hazardous wastes due to their high alkalinity.

Other industries generate only 2,6% of wastes and domestic waste accounts for only 3,5% of total waste produced.

According to the Landfill Register, Estonia has over 450 active and closed landfills (domestic, industrial and agricultural). A total of 263 (1999) landfills are registered to receive municipal waste and of this total 57 landfills (incl. 7 industrial) are in operation. One of the goals will be reduction of landfills to 10-15. This involves the closure of many existing landfills and the stabilisation of closed landfill sites as well construction of the regional landfills meeting the EU requirements. After enforcement of Estonian Landfill Decree in September 2001 there were 14 landfills closed in 2001 and the closure of 48 landfills is budgeted to 2002.

In 2000 two new landfills started to operate - a landfill for non-hazardous waste in Järva County and the Vaivara landfill for hazardous waste. In autumn 2001 Uikala landfill will start to operate. All these landfills comply fully with the requirements of the Directive 1999/31/EC.

Hazardous wastes management system is currently being developed in Estonia in line with EU Directives, covering collection, sorting, transportation and treatment of hazardous wastes. Still there is need for upgrading the system and especially final treatment and safe depositing in the future, in order to receive increasing volumes of hazardous wastes when system will be fully operational.

Waste from oil shale electric power stations and shale oil production makes up more than 90% of total amount of hazardous wastes generated in Estonia.

Estonia has requested a transitional period until July 16, 2009 for implementing the requirements of Article 14 d) and i) of the Directive 99/31/EC. This request concerns in particular the application of Article 5 (3) a) and b) in regard to oil shale ash only, in order to develop and implement new methods of disposal of oil shale ash derived from the generation of energy.

The biggest energy producer in Estonia is AS Narva Elektrijaamad (NEJ) generating power from oil shale. NEJ has started to upgrade its technologies and equipment for combustion of oil shale, purification of flue gases, ash removal and landfilling. In the future the landfill can be evaluated as landfill for non-hazardous or even inert waste, with no liquid component and hazardous properties listed in Article 5 (3) b) of the landfill Directive.

Table 2.5.4: NEJ Oil-shale ash landfills

Location		**Total area (hectare)**	**Disposal area (hectare)**	**Landfill size (mil. tons)**
Narva town Balti PP (Power Plant)	Ash field NO 1	490	360	82,8
	Ash field NO 2	570	400	31,9
	Industrial waste	4,3	4,3	0,37
Vaivara Parish Eesti PP		810	500	115,2

Landfill Register 01.01.2003

The projects which will be implemented in the years 2003-2006 in waste sector are the following.

- South-East Estonian Waste Management (Construction of a new regional landfill). Estimated cost 8,7 MEUR.
- Hazardous Waste Management (Construction of hazardous waste chemical and thermal treatment plant). Estimated cost: 7,5 MEUR.
- Remediation of Kohtla-Järve ashfield. Estimated cost: 9,6 MEUR.
- Renovation of oil-shale ash removal system in Narva power plants. Estimated cost: 250 MEUR.

- Remediation of oil-shale semi-coke landfills Phase I. Estimated cost: 37 MEUR.

2.6 Nature Conservation

From the point of view of climate, Estonia is located in a transition zone between marine and continental climates, and in regard to natural vegetation, on the borderline between mixed and coniferous forest zones. The land surface, shaped after the Ice Age, includes diversified forms. There are many inland bodies of water and the coastline is jagged with abundant inlets. All these aspects, in combination with extensive well-preserved forests and marshes and long-term agricultural land use, have created conditions for diverse natural habitats.

One of the most important factors for maintaining biodiversity is the condition of natural habitats of rare and endangered species. The inventory of natural habitats has shown a considerable decline in the area of grassland habitats (mainly wooded meadows, alvars, wet alluvial floodplain meadows and coastal grasslands). This is attributable to abandonment of traditional agricultural technology (mowing, moderate grazing) in the rural areas of Estonia (Table 2.6.1).

Table 2.6.1

Decline in the Area of Some of the Habitats[1]

Type of the habitat/community	Area in the middle of the 20th century	Area in the end of the 20th century
Wooded meadow	800 000	200 (in use)
Alvars	43 500	5000
Alluvial floodplain	100 000	10 000
Coastal grasslands	200 000	5000

1) inventories were made in the middle of the 1990s

Source: Talvi, T. 2001. Semi f-natural habitats.-Center of Ecological Technologies, Viidumäe - Tartu

In recent years drainage has been the main factor damaging swamp and fen habitats. The state of forest habitats is relatively good, but the area of swamp forests has shrunk over time.

In the 20th century, three Red Data Books were compiled in Estonia. The last one, completed in 1998, enlists 1,318 different life forms. Major risk factors have been identified for each of the different habitats. There are 401 endangered species in the forests threatened by changes in the balance of tree

species, the draining of woodlands and a reduction in the relative share of rotting wood in forest management. Some 314 species are endangered in bodies of water, threatened by pollution in water and areas of eutrophication, ass well as by extensive construction activities. In meadowlands 114 species are under pressure from the overgrowth of bushland, which takes over when mowing and grazing come to an end. The number of endangered species in other habitats is relatively smaller.

As of January 1, 2001, there were 312 protected areas in Estonia in accordance with the Protected Natural Objects Act. The total of protected areas - 462,200 hectares - comes to more than 10% of Estonia's mainland, including inland bodies of water. This act also regulates the protection of fossils and minerals, individual natural objects (1,207 in 2000) and either endangered, or rare, species of plants, fungi and animals.

In comparison with several central EU member states, biodiversity has survived relatively well in Estonia. The different types of protected habitat amount to more than 10% of the territory of the country. Estonia has remarkable numbers of large game animals: bear - 500 specimens (the highest population concentration in Europe), lynx - 1000 specimens, wolf - 150 specimens, and approximately 10,000 beavers. The abundance of protected areas in almost untouched natural condition is one of the essential and increasingly important resources of Estonia.

In addition to biodiversity, natural landscapes are an important aspect of the environment. The natural scenery of Estonia has been shaped as a result of the historically changing interaction of man and nature and is, therefore, largely contingent upon socioeconomic changes. Landscapes represent different values: cultural, historical, aesthetic, natural, recreational and tourist values, but also those involved with identity. Picturesque landscapes are also an important resource in economic development, and any reduction in the value of a landscape is a loss for society.

Today, natural scenery in Estonia is most seriously endangered by damage, or complete ruin, brought about not only by the mining of mineral resources and the establishment of industrial enterprises, but also by land falling out of use.

Production output in agriculture has dropped considerably since 1980. This means that decreased use of fertilizers and crop protection chemicals, as well as a reduction in the numbers of livestock, has considerably diminished the negative impact of agricultural activities on the environment. At the same time, leaving agricultural land out of use has brought along a new environmental problem: valuable agricultural landscapes have started to disappear.

The growth of bushland and other forms of visual pollution connected to the abandonment of production facilities and buildings have become a common problem in large agricultural areas over the past few years.

Stock has been taken of valuable landscapes as part of a county-level planning process, and as a result, regional landscapes have been divided into areas designated as landscapes of special local value. A specification of ethnic landscapes is also being planned. Such inventories will be taken into account in future general planning. Maintenance plans for valuable landscapes are also of great importance.

Landscapes with cultural-historical value in Estonia (incl. semi-natural habitats) are endangered most of all by the drop in agricultural activity, by the fact that many people are leaving villages, and by the consequent growth of bush in open areas and the slow dilapidation of abandoned buildings. These landscapes are also threatened by extensive clear-cutting of forests and by construction activities, especially in attractive coastal areas or on the outskirts of towns. In certain areas also, afforestation of agricultural land could cause initial problems. Existing and potential recreation areas in larger towns, suburbs and scenic coastal areas are, above all, threatened by harsh economic exploitation (extensive construction, the razing of forests), but also by simple lack of maintenance. The same problems are relevant in the protection of landscapes of aesthetic value. On the one hand, conservation of cultural landscapes presumes careful planning of economic activities and new constructions to avoid disintegration of existing values. On the other, cultural landscapes can only be protected by expedient maintenance. For this purpose it would be beneficial to expand the application of landscape maintenance subsidies and promote local initiatives in landscape maintenance, supporting thereby the overall development of villages.

Maintaining cultural heritage in the form of traditional settlements and land use patterns, as well as conserving valuable landscapes and creating awareness of their existence, will help to invigorate local identity and promote tourism in rural areas. The preservation of cultural landscapes will also help to maintain landscape and biological diversity.

Apart from the Ministry of Environment, the County Environmental Departments, Nature Reserves and National Parks Administrations will be involved in this project.

For the project management and co-ordination, the Minister of the Environment will appoint a responsible high-ranking civil servant, who will ensure involvement of officials of the Ministry as well as County Environmental Departments and Nature Reserves, National Parks.

A Nature Conservation Department of the Ministry of Environment is responsible for the implementation of the nature conservation policy. At the present moment one civil servant has been employed full-time responsible for Natura 2000 implementation in Estonia and two civil servants are working partly in this issue at the Nature Conservation Department. Two more officers will be employed full-time from the beginning of 2001. These two officers will be responsible for Natura 2000 database compilation, digitalisation and development of GIS on Estonian Natura 2000.

The County Environmental Departments are installed by the Ministry of Environment and are assigned to carry out nature management in their administrative region. One to two nature conservation officers are working at the each County Environmental Department. Administrated Nature Reserves are also responsible for the management of respective protected areas. These institutions will have a share in site selection, database compilation and site management.

A project supporting infrastructure investments for nature conservation will be prepared using ISPA technical assistance in the nearest future. During the TA project eligible measures for protection, management and infrastructure investments of Natura 2000 areas will be selected for further implementation.

3. KEY FEATURES OF ENVIRONMENTAL POLICY

3.1 General

The principles of Estonia's environmental policy are enshrined in a number of laws on nature management and conservation, etc. These include the Act on Sustainable Development (1995, considered to be unique in Europe), Act on Protected Natural Objects (1994), Act on Pollution Charges, Act on Environmental Impact Assessment and Environmental Auditing (2000), Water Act, etc.

Increased pressure on the environment has heightened the importance of the development of a logical and implementable environmental policy. These considerations led to the development in Estonia of two basic environmental policy tools:

- National Environmental Strategy (NES - adopted by Parliament in March 1997),
- National Environmental Action Plan (NEAP - adopted by Government in May 1998, revised in June 2001).

Adoption of the NES by Parliament and NEAP by Government ensures that Estonia's environmental policy tools are implemented through executive action programmes. Thus, the Government's development policy is considered to be environmentally sustainable and environmental restrictions have to be considered in the economic sphere.

National Environmental Strategy (NES) specifies 10 priority goals of environmental management and protection and defines the main short-term and medium-term tasks to be achieved by 2000 and 2010 respectively.

Estonia - Ten Environmental Policy Goals (NES)

- Promote Environmental Awareness
- Reduce Energy Sector Pollution
- Promote Clean Technology
- Improve Air Quality
- Waste - Generate Less, Improve Treatment
- Clean-Up Past Pollution
- Improve Groundwater Protection & Use
- Protect Surface Waters & Coastal Seas
- Preserve Landscapes & Biodiversity
- Improve Quality of Built Environment

The relevant Policy Goals and Tasks, taken from the National Environmental Strategy (NES) have been considered in the selection and development of Estonia's project pipeline for the environment (2000-2006). One of the main considerations in the establishment of the pipeline is the potential of each project to contribute to these goals.

The National Environmental Action Plan (NEAP), using the NES as a basis, develops a detailed series of costed actions to address the priority goals identified in the NES. The NES therefore forms Estonia's strategy for implementation of its policy of protection and improvement of the natural environment, while the NEAP forms the key-planning tool. At the same time, several instruments, such as research and development, economic instruments are recommended to achieve these goals.

The NES and NEAP are influenced by EU accession needs and are in line with the priorities, specified in Estonia's Accession Partnership Agreement. In addition, the National Plan for Adoption of the *Acquis* (NPAA) 2002-2003 takes the NES and NEAP priorities into account and focuses mainly on transposition of the legislation and the administrative structures as 01.01.2003. NPAA also addresses adoption and implementation of the cost-intensive directives, where Estonia has requested transition periods up to 2013 and plans concrete actions year by year to comply with these directives.

Accession Partnership Agreement (AP), adopted by EU Council in 13 November 2001 specifies priority areas between Estonia and European Union, to be tackled within accession. For environment sector, AP specifies following:

- Complete transposition of the acquis, with particular emphasis on water quality and waste management,
- Continued implementation of the acquis, in particular as regards waste landfill (establish waste management plans and find sustainable solutions to the handling of wastes from extraction, incineration and refining of oil shale), discharge of dangerous substances in the aquatic environment (establish pollution reduction programmes) and nitrate pollution from agricultural sources; strengthen efforts to meet microbiological parameters for water intended for human consumption,
- Continued strengthening of administrative capacity, in particular at regional and local level,
- Continue to integrate environmental protection requirements into the definition and implementation of all other sectoral policies with a view to promoting sustainable development.

Current RF for CF is focusing at the same areas specified by AP and all the projects looking for EU co-financing are addressing of those.

3.2 Environmental Legislation

As part of the accession process, Estonia is undertaking a range of measures to comply with the acquis communitaire. The process of legal harmonisation, an integral part of the accession process, is under way. As agreed in the negotiations of the Accession Partnership Agreement the transition period concerning a number of EU Directives for various reasons. In most cases the transition is necessary due to a heavy financial burden. These directives are:

- Volatile Organic Compounds (VOC) Directive (94/63/EEC): transition period until 2004 and 2006 for the construction of petrol vapour regeneration systems taking into account the throughput of stations and terminals,
- Urban Waste Water Directive (91/271/EEC): transition period until 2010 for the renovation / construction of sewerage systems and wastewater treatment facilities for smaller agglomerations,
- Drinking Water Directive (80/778/EEC): transition period until 2013 for the renovation / construction of water supply systems and water treatment facilities,
- Limitation of Emissions of Certain Pollutants into the Air from Large Combustion Plants Directive (2001/80/EC): transition period until 31 December 2015 for the rate of desulphurisation and for solid particles emitted from existing combustion plants firing oil shale.

As regards planning and implementation of major environmental infrastructure projects, the following legal acts are considered relevant:

Environmental Impact Assessment (EIA)

All projects are subject to an initial Environmental Assessment and, if necessary, full EIA. The EU EIA Directive is fully approximated into Estonian legislation after approval of the Act on Environmental Impact Assessment and Environmental Auditing (enforced from 01.01.2001). Environment Impact Assessments for projects are carried out following the Estonian legislation and the following EU legislation:

- Council Directives 85/337/EEC of 27 June 1985 (On Assessment of the Effects of Certain Public and Private Projects on the Environment),

- Council Directive 97/11/EC of 3 March 1997, Amending Directive 85/337/EEC.

Protection of Vulnerable zones or Sensitive Areas

Requirements of the directives aiming at the safeguarding bio-diversity will be followed as Estonia is currently transposing the requirements of European Union's nature conservation directives into Estonian legislation and carrying out inventories necessary for selecting the sites, setting up the database and drawing up maps for Natura 2000. As projects for 2000-2006 are mostly aiming rehabilitation of existing infrastructure, no reverse effect to sensitive areas is foreseen prior full transposition of the relevant acquis. Eligibility criteria and priority activities of nature protection for the future Cohesion Fund project(s) will be developed with help of ISPA TA. Considered are especially Directives 79/409/EEC and 92/43/EEC on important bird and habitat areas.

Also sensitive areas as indicated in the Urban wastewater Directive 91/271/EEC will be safeguarded from additional load of nutrients and more stringent treatment techniques will be applied according to the HELCOM recommendations at wastewater treatment plants.

Vulnerable zone according to the Nitrate directive has been designated in the Pandivere and Adavere-Põltsamaa region by the regulation of the Government No 17 of January 2003. The nitrate pollution of groundwater and surface waters on those areas is mainly caused by the intensive agricultural activities such as intensive farming and land use. Special requirements for storages and use of fertilizer and silage are established by governmental regulation in nitrate sensitive areas. There is a plan to develop CF project to minimise point and non-point agricultural nitrate pollution by renovating and constructing appropriate manure and slurry storages in the sensitive areas. Current project would also contribute to protect Pandivere river basin sub-district ground and surface water.

3.3 Air Quality

The most important EU legislation is presented below together with the possibilities of its implementation and financial sources required.

Estonia is making efforts to improve air quality and to meet the requirements of the EU Directives in this regard:

- Air Quality Framework (96/62/EC and it's daughter directives, 1999/30/EC,

2000/69/EC),

- Large Combustion Plants (88/609/EEC replaced by 2001/80/EC),
- National Emission Ceilings for Certain atmospheric pollutants (2001/81/EC),
- Promotion of Electricity produced from renewable energy sources in the internal electricity market (2001/77/EC),
- Integrated Pollution Prevention And Control (96/61/EC),
- Air Pollution From Industrial Plants (84/360/EEC),
- Long Range Transboundary Air Pollution (Geneva Convention) and its protocols,
- UN Climate Change Framework Convention and its Kyoto protocol,
- VOC emissions from storage and transport of petrol (94/63/EEC),
- VOC emissions from the use of organic solvents in certain activities and installations (99/13/EC),
- Liquid Fuel Quality (93/12/EC, 98/70/EC, 1999/32/EC),
- Lead content of petrol (85/210/EEC).
- Promotion of electricity produced from renewable energy sources (2001/77/EC)

Estonia is making efforts to approximate the requirements of the most important EU Directives in regard to energy production:

The Government of Estonia has made a principal decision to increase the environmental charges to the level of countries of European Union. On 13.12.2001 the Government of Estonia approved new environmental charges for 2002-2005. The charges will be increased approximately by 20% per year.

Table 3.3.1 Environmental fees (Estonian kroon/t)

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
SO2, kr/t	38.28	46.00	55.20	66.24	79.00	95.00	114.00	137.00
NOx , kr/t	87.84	105.4	126.48	151.68	182.00	218.00	262.00	315.00
Fly ash, kr/t	38.28	46.00	55.20	66.24	79.00	95.00	114.00	137.00
Ash deposition, kr/t	1.3	2.4	3.8	4.1	4.4	4.6	4.9	5.1
CO2 , kr/t	-	-	5.00	7,5				
CO kr/t					11.00	14.00	16.00	20.00

VOC kr/t					182.00	218.00	262.00	315.00
Heavy metals kr/t					2896.00	3476.00	4171.00	5005.00

Act on Environmental Fees foresees replacement of the fees with obligation to invest into environmental measures, if due to these measures emissions will be reduced at least by 25%. On 2000, Minister of Environment signed agreement with Narva Power about replacement of air emission fees in amount of 100 MEEK, which Narva Power will invest for replacement of Electrostatic Precipitators of Power Plants. For the reduction of the negative environmental impact during the 2000 besides economic instruments, also regulatory measures were applied. In the beginning of the 2000 Government adopted National Programme for Energy Conservation and in July, National Programme for Reduction of the Air Emissions from the Large Combustion Plants for 1999-2003, was adopted. Remarkable step in 2000, was Estonia's joining the Convention of the Long-Range Transboundary Air Pollution Reduction and its Protocols.

Technological upgrades of Estonian oil-shale-burning power plants that will be implemented with support from the Cohesion Fund, will reduce long-range ambient air pollution remarkably. Through the sub-measure "Renewable energy" of the Single Programming Document (SPD), expansion and utilization of renewable energy sources will be supported in small-scale applications. In general the projects in air sector are such a large scale that it was decided to finance them from CF where financial means are considerably higher.

Proceeding from the National Program for Reduction of Pollutant Emission from Large Combustion Plants and the National Program for Reduction of Greenhouse Gases Emissions, the current sub-measure will support energy-related activities with direct or indirect impact on ambient air that are not supported from the Cohesion Fund or the Single Programming Document sub-measure "Renewable energy".

The "Renewable energy" sub-measure of SPD will also support other investments into industrial production, promoting protection of ambient air, primarily implementation of Best Available Technique but also for construction and renovation of ambient air pollutants treatment facilities at enterprises, including renovation and/or construction of technology and capturing systems in enterprises whose activities have caused or should exceed the limit values for ambient air pollutants.

3.3.1. Large Combustion Plants

The legislative framework for adopting the requirements of the Directive 2001/80/EC is established by the Ambient Air Protection Act and regulations issued on the basis thereof. The national reduction plan option may be used as a basis for compliance with the requirements of the Directive. In addition to the reduction plan the emission limit values will be established by the Regulation of Minister of the Environment on the basis of the Ambient Air Protection Act. The permitting authorities will issue permits on the basis of national reduction plan and emission limit values established by the Minister of the Environment. Some combustion plants may use the option of written declaration not to operate the plant more than 20 000 operational hours based on the Article 4 p.4 of the Directive. As there have been no large combustion plants built in Estonia after June of 1987 there is no need for establishing the limit values for this category of plants. The emission limit values for the plants that will be built after the adoption of the Directive will be established on the basis of the requirements of the Directive.

The implementation of LCP Directive is the biggest problem for Estonia as these installations mainly belong to the state or to municipalities and they do not have resources for the required investments. The only way to get resources for investment for them would be the raising of the prices for electricity and heating energy. This would lead to the rising of the prices in all economic sectors. Due to the above-mentioned considerations it is necessary to get support from CF or similar EU structural fund.

3.3.1.1. Legislation

Estonia will bring its legislation in line with the requirements of Directive 2001/80/EC by the moment of accession to the European Union at the latest. To achieve compliance with the Directive, a revised draft has been prepared, to replace Minister of the Environment Regulation No 60 of 26 October 1998, establishing emission limit values for pollutants per unit of volume of gases emitted from large combustion plants. The new draft takes into account the requests for the periods of transition described below.

The Ministry of Environment is responsible for the area involving large combustion plants, and also develops the relevant legislation. The county environmental services of the Ministry of the Environment are in charge of issuing pollution permits in line with the emission limit values based on the Directive. The enterprises are responsible for monitoring emissions and for funding thereof.

3.3.1.2. Institutional basis

In order to implement the Directive (i.e. to achieve emission reductions by 1 January 2008), as provided for in Art 4 3 (a) of the Directive, Estonia intends to take appropriate measures to ensure that all pollution permits of the existing plants contain conditions relating to compliance with the emission limit values established for new plants referred to in Article 4 of the Directive (part A of Annexes III-VII) in respect of sulphur dioxide, nitrogen oxides and dust, except for the periods of transition described below. Estonia intends to apply the emission limit value approach. Except for the requests for the transitional periods, the emission limit values to be established by the new Minister of the Environment Regulation will be in full compliance with the requirements of the Directive.

Estonia has no new combustion plants in the meaning of the Directive (i.e. plants for which the construction license or operating license was granted on or after 1 July 1987 pursuant to Art 2 (9) of the Directive). Estonia's large combustion plants fall into the category of "existing plants" as defined in Art 2 (10) of the Directive (plants for which the construction license or operating license was granted before 1 July 1987). The requirements prescribed in the Directive will be taken into account upon the construction of new combustion plants or renovating the existing combustion plants.

10 combustion plants with 66 boilers come within the scope of the Directive in Estonia, whose total rated thermal input is 10916 MW and rated electrical input is 2965 MW. The combustion plants are fired by solid, liquid or gaseous fuel. The existing plants are predominantly owned by AS Eesti Energia, a 100% state-owned enterprise.

The oil-shale fired power plants cover at present (based on data for 2001) 93% of the domestic electricity consumption.

3.3.1.3. Requested and approved transitional periods

1. Estonia requests a period of transition until 31 December 2015 for the rate of desulphurisation prescribed pursuant to Art 4(3) of Directive 2001/80/EC in part A of Annex III (solid fuels) for existing combustion plants firing oil shale. Instead of the minimum rate of desulphurisation allowed in Annex III A of the Directive due to the characteristics of the fuel, Estonia applies a minimum rate of desulphurisation of 65% for its oil shale fired boilers from 1 January 2008 to 31 December 2015.

2. Estonia requests a transitional period for emission limit values for solid

particles (dust) emitted from oil shale firing combustion plants, prescribed in Part A of Annex VII of Directive 2001/80/EC (Emission limit values for dust) from the due date of 1 January 2008, as established by the Directive, to 31 December 2015. During the above period dust emissions will not exceed 200 mg/Nm^3.

Estonia requests a transitional period for SO2 emissions for four plants (with 29 boilers) firing oil-shale out of the total of 10 large combustion plants (with 66 boilers). The remaining large combustion plants firing oil-shale will be closed or renovated before 1 January 2008, except for those, which are operating in compliance with the requirements of the Directive.

Achieving a desulphurisation rate higher than 65% in the case of existing oil shale firing plants is not technically and economically feasible, nor is it feasible for the purposes of protecting the environment as a whole, furthermore, it would not contribute to achieving the final goal of the Directive.

Due to the high ash content (50%), CaO content (16%), moisture content (12%) and a low calorific value (8%) of oil-shale, increasing the rate of desulphurisation in the case of the existing oil shale firing plants cannot be achieved by using the so-called end-of-pipe technologies without causing other negative consequences for the environment. Moreover, the use of sulphur removal equipment would result in exceptionally high energy consumption and increase in the volume of waste. Therefore Estonia intends to replace a required number of existing oil-shale firing boilers with new fluidized bed boilers, which render compliance with the requirements of the Directive possible, and close the units, which are not in compliance with the requirements by the end of 2015.

The requested transitional period is also in line with the principles of the IPPC Directive, which emphasize a comprehensive approach to pollution control (96/61/EC, art. 1 and art. 3)).

The transitional period for applying the emission limit values for solid particles will not have a significant impact on the environment, since most of the oil shale firing boilers are already today in compliance with the limit values established by the Directive (except 6 boilers in the Eesti Power Plant, 4 boilers in the Balti Power Plant and the boilers in the Ahtme and Kohtla-Järve Power Plants). The request for the transitional period derives from the need to keep the electrostatic precipitators installed in 1996-2000 (e.g. in the Eesti Power Plant) in operation until the end of their economic life, since their replacement before is not economically feasible. The guaranteed economic life of the precipitators is 15 years.

The request for the transitional period for applying the emission limit values for solid particles also derives from the need to build the process of renovation of electrostatic precipitators into the general timeframe for renovating the boilers, in order to avoid unnecessary costs before the complete renovation of the power units. Another reason for requesting a transitional period relates to the technical restrictions contained in the renovation schedule, which in turn are caused by the scarce resources and the need to ensure security of electricity supply at all times.

The high costs of the planned investments also call for a transitional period. Trying to accommodate the renovation and investment process into a tighter schedule would have a significantly negative impact on both the Estonian industry and domestic consumers. Moreover, it would not be possible to ensure the required funding for a more compressed investment plan.

It has been agreed during the negotiations of 2004-2006 SPD that large-scale infrastructure projects related to the reconstructing oil shale energy sector will seek financing from the Cohesion Fund. The measures are foreseen for renovating the oil-shale firing power plants and installation of the fluidised bed boilers and for constructing new generating facilities using other fuels. Funding for the investments necessary for the reconstruction of the oil share firing power plants will be partly obtained by the state-owned energy company Eesti Energia in the form of borrowing from international financial institutions and a bond issue. Private investments are also expected for the reconstruction of the energy sector.

The "Long-term Development Plan for the Estonian Fuel and Energy Sector" (approved by the Parliament on 18 February 1998) sets ten strategic goals for the work of Government, among others:

- to conform to international environmental requirements;
- to provide higher efficiency in oil shale based energy production with the concurrent and significant reduction of the harmful environmental impacts through the improvement of combustion technology.

Rules for allowing state aid are fixed in Competition Act and in secondary legislation. An environmental state aid is given to private entities according to regulation "Special conditions of environmental state aid" adopted by the Government in December 2002, which fully complies with " Community guidelines on State aid for environmental protection" (2001/C 37/03).

3.3.2. Usage of renewable energy sources and energy saving

The key principles of energy policy in Estonia are stated in Long-Term Development Plan for the Estonian Fuel and Energy Sector (on 18 February 1998 the Plan was approved by the Government), On the basis of the Programme for Energy Savings and Action Plan for Restructuring of Estonian Oil Shale Energy the following can be stated:

- The use of new technologies for burning of fossil fuels and orientation to less polluting energy sources, including renewable energy sources, together with dispersion of the production minimises the negative environmental impact,
- Cleaner environment guarantees the development of country, biodiversity and better health protection,
- Due to the differences in regional development it is necessary to improve the energetical infrastructure in less-developed regions,
- The implementation of the above-mentioned statements helps to strengthen the economy.

One of the primary tasks of the national energy policy is to reduce the environmental impact of energy sector. This cannot be achieved without changing the structure of energy sources towards the usage of less-polluting fuels (natural gas) and also towards the usage of renewable energy sources (biofuels, wind- and hydroenergy). Regardless of the great potential of Estonian renewable energy sources their application has been insufficient. Renewable energy sources are used mainly for heating and end-use. In electricity production their share is almost non-existent.

An additional effort must be made to support a greater use of renewable energy sources locally available. In the frame of Directive 2001/77/EC, Estonia has set up a target for a contribution of 5.1% of electricity from renewable energy sources in the year 2010.

Important direction in development of energetics is to raise efficiency in the whole sector and to reduce the energy consumption.

All used measures like the renovation of the existing equipment or their substitution with more efficient systems, designation of combined production techniques, the usage of management systems which guarantee the energy savings at producers, distributors and users, should be based on concrete investment decision. The latter is being supported by the creation of auditing systems based on the Programme for Energy Savings, i.e. the installations that will need the energy saving measures from the economical point of view are identified in the process of auditing of buildings, industry and boilers.

The great potential of heat and electricity co-production is evident but it is insufficiently applied. For a usage of this notably high energy saving potential it is necessary to apply the existing long-distant heating systems and supply the perspective distant heating regions. The precondition for up-grade of competitive heat and electricity co-production is the raising of technical level and effectiveness of the distant heating systems which is also the main task in the sphere of energy savings. The limited markets for heat energy and their lowering trend has been one of the obstacles in following the principle of dispersion of the energy production according to the Long-Term Development Plan for the Estonian Fuel and Energy Sector.

There is a need for a support from CF or other EU structural fund to launch energy audits and to implement the required measures for energy savings based on the findings of the audit. Above all, the energy saving projects should be supported on the public sector installations to reduce the expenditures of public sector on energy production and distribution.

3.3.3. Volatile Organic Compounds

In the Position Paper, Estonia has stated that the country is ready to transpose relevant legislation concerning air quality by 01.01.2003. Exception is made for Volatile Organic Compounds (VOC) Directive (94/63/EEC) where transition periods until 2006 for the construction of petrol vapour regeneration systems taking into account the throughput of stations and terminals are required.

As regards Directive 94/63/EC on the control of volatile organic compound emissions resulting from the storage of petrol and its distribution from terminals to service stations, mostly owned by private sector. Financing of related projects is expected to be done by the owners.

There are about 305 petrol stations and 9 terminals in Estonia. Majority of petrol stations is in compliance with the Directive.

3.3.4. Status of Air Quality projects

The process of transposition of above mentioned EU Directives was enabled by Twinning Project on Air Quality Management: Issues for EU Accession (Project ES98/IB-EN-01 (a) Air Accession).

The project was commenced on 1st of October 1999 and terminated on 30th of September 2001. The project was divided into two parts as follows:

During the first year, the project focused on

- Assessing the need to revise the legislation related to air protection,
- Proposing necessary amendments in the legislation,
- Assessing the need to strengthen the administration in air protection sector.

In its second year, the project concentrated on proposing the necessary measures to be taken, in particular in the sector of administration and training.

As the result of the above-mentioned Twinning Project a new project for Air Quality Management System was proposed and financing from PHARE 2002 applied.

The goals of Air Quality Management System Project are implementation of Air Quality Framework Directive and its daughter Directives are:

- Improvement of Air Quality Monitoring and Meteorological System,
- Improvement of different meteorological, emission and emission databases,
- Creating of the Air Quality Model,
- Public information and information for decision-makers and supervisors on air quality.

3.3.5. Fuel Quality

The new project "Development of Estonian Fuel Quality Monitoring and Inspection System" has been launched to ensure that the quality of fuel is in compliance with EU legislation and European Standards. The project will be financed by PHARE 2003 programme.

The goals of the project are:

- Improvement of Fuel Laboratory,
- Creating National Fuel Quality Monitoring System,
- Improvement of administrative capacity (including Legislation and Supervision).

The project is in compliance with the Long-Term Development Plan for the Estonian Fuel and Energy Sector (on 18 February 1998 the Plan was approved by the Government) which lays down the main goals for Estonia's energy strategy. The ones relevant for current project are:

- To provide the sufficient and stable fuel and energy supply in conformity

with the required quality and with optimal prices for the consistent regional development and for reaching the economic growth level required for the accession to the European Union,

- To provide the political and economic independence of the state by the fuel and energy supply as a strategic branch of economy, to establish the strategic security reserves in conformity with the requirements of the European Union,
- To provide conformity with the international environmental requirements,
- To provide euro-integration of the Estonian energy sector in conformity with the EU directives and trends.

3.4 Water and wastewater

In the Position Paper Estonia sees major problems with compliance to the acquis in water sector. Due to the needs for significant investments into the infrastructure transition periods were agreed by European Commission for the following directives:

- Urban Waste Water Directive (91/271/EEC): transition period until 2010 for the renovation / construction of sewerage systems and waste water treatment facilities,
- Drinking Water Directive (98/83/EEC): transition period until 2013 for the renovation / construction of water supply systems and water treatment facilities.

There are planned transitional measures to implement Drinking Water Directive (98/83/EC):

- Chemical parameters (fluoride, boron) must be in correspondence 31.12.2003,
- Indicator parameters must be in correspondence settlements with 2000 or more inhabitants 2008 (with exemption iron parameter for 2007) and settlements less than 2000 inhabitants 2013.

It is enacted in the Water Act that Estonian water management is organised according to the River Basin Management Approach, which include establishment of management structures, development of management plans and relevant investment programmes for improvement of water quality. Estonian Government established with Regulation number 124 Designating River Basin Districts and Sub-River Basin Districts from 3rd of April 2001 one river basin district and 9 sub river basin districts in the country. The sub-river

basins are following[1]: Harju sub-river basin district, Läänesaarte sub-river basin district, Matsalu sub-river basin district, Peipsi sub-river basin district, Pärnu sub-river basin district, Viru sub-river basin district, Võrtsjärve sub-river basin district, Koiva sub-river basin district, Pandivere groundwater sub-river basin district. According to that kind of division there is a commitment to prepare one river basin management plan and 9 plans for sub-basins. Guidelines on water management plans have been already prepared. There is a plan to establish water management information system to analyse pollution flows, water bodies and groundwater status. The overall objective is to achieve good ground and surface water ecological status. The water resource management plans for sub-river-basins will be composed by 2006 and after that the general water resource management plan for Estonia will be drafted by the end of 2008. The overall objective is to achieve good quality of ground and surface waters.

There is an intention to compose CF projects for each sub-basin to minimise pollution loads and to provide good quality drinking water for local people.

River basin management plans (sub-basin plans) will be used to apply project implementation assistance from EU structural funds in future. The further investments will also be based on the sub-basin management plans as the management plans shall establish the program of measures for water use and protection, and respectively indicate the investments needed to implement these measures. The program must provide measures for improving or maintaining the status of water bodies and groundwater aquifers as close to natural conditions as possible, for the protection of water fauna, to ensure the compliance with the existing legislation in force, for the cost-recovery of water use, to control the water abstraction and impacts on water, to minimize the impacts of point and diffuse pollution sources and to control the marine pollution.

Long term water management plans are very important instrument for Estonian sustainable water use and protection. Within the framework of the Environmental Protection Programme of the Ministry of Environment, a sub-programme for Protection of Water Resources has been developed. The cost of the sub-programme is covered from the financial means of the Environmental Investment Centre (EIC), i.e. from revenues from use of the environment, from the budgets of local municipalities and enterprises' own equity. The rest is covered by foreign assistance and loans. The sub-programme focuses on implementation of the EU directives regulating the protection and use of water resources. The main objective of the sub-programme is to achieve the good statues of surface water and ground water.

[1] Please see map of sub rivers in annex IX

For meeting this objective, new wastewater treatment plants will be constructed, and the existing wastewater treatment plants and waste water collectors reconstructed. Another objective of the sub-programme is to increase the number of people supplied with drinking water meeting the established quality requirements. In order to achieve this objective, investments are needed for replacement of old pipes and construction of water treatment plants.

The sub-programme will also provide a framework for the financing of a new water protection framework aimed at implementing the EU directives, drafting of water protection requirements and provisions, national inspection monitoring, and other activities and research work necessary for implementation of the directives.

Same kind annual investment programmes for river basins and for major cities are and will be developed in the future and number of projects looking for co-financing are specifically addressing the water quality.

The NES and corresponding action programme for implementation provide the basis for a new approach towards more efficient water resource use and water management. The government goals for water protection are:

- To reduce surface water pollution from municipal waste water,
- To reduce pollution with industrial and agro-industrial waste water,
- To reduce groundwater pollution,
- To reduce non-point source pollution of water bodies,
- To reduce pollution with surface (storm water) run-off,
- To reduce the pollution load flowing into the sea,
- To prevent sea water pollution from oil product transport,
- To reduce the polluted water inflow from other countries.

The objectives of water resources protection are:

- To protect freshwater resources from overuse while extracting water from water intake sites,
- To prevent further changes in the natural hydrographic network structure.

Construction of wastewater treatment facilities remains the highest priority for investments, particularly for funds from the EIC loans and subsidies received by the State. It is also necessary to implement measures for the reduction of non-point source pollution of ground and surface waters, to gradually restructure the financial mechanism for the wastewater sector by the introduction of the polluter/consumer pays principle, and to develop the

necessary water protection laws.

According to the European Union Common Position (Conf-EE 13/01) on urban waste water treatment directive (91/271/EEC):

- Collecting systems according to the article 3 will be provided from 31 December 2009 in agglomerations of a population equivalent above 10 000,
- Collecting systems according to the article 3 will be provided from 31 December 2009 in agglomerations of a population equivalent between 2000 and 10 000,
- Wastewater treatment will be provided from 31 December 2002 in all agglomerations with population equivalent more than 10 000,
- Wastewater treatment will be provided from 31 December 2010 in all agglomerations with population equivalent more than 2000.

According to the Sewage Sludge Directive (86/278/EEC) sludge treatment units have to be constructed. The sludge treatment has to be in accordance with the requirements of the Directive by the moment Estonia accesses the EU.

The vulnerable zones nitrate pollution reduction programmes must be implemented on the 31 of December 2008 to implement nitrate pollution directive from agricultural sources (91/676/EEC).

Groundwaters in surface boundary layers are irreversibly damaged due to earlier contamination on extensive areas surrounding industrial regions in Northeast Estonia and Tapa. Smaller contaminated areas can be found all over Estonia. Areas damaged by residual pollution are dangerous for the health of the population, above all, because of polluted drinking water but also resultant to direct contact with poisonous substances. Emission of toxic dust can pollute the ambient air within buildings. Utilisation of contaminated areas means serious economic risks for entrepreneurs as the legislation does not provide for any regulations concerning the accountability for the elimination of earlier contamination.

As for the residual pollution created by transport sector, the contamination left by a number of asphalt concrete factories has be liquidated so far, but this work needs to be continued. Considerable expenditures are related to the liquidation of residual waste in areas surrounding ports and the waters of thereof and railroad junctions. The system for the prevention and fast liquidation of environmental emergencies should be developed as a part of the transport sector's development process. Bringing the agriculture into compliance with environmental requirements presumes environmentally sound liquidation of old poisonous substances, chemical and liquid fuel

terminals. The local governments are responsible for maintaining the boiler houses and fuel terminals within their respective administration areas.

Risks related to residual pollution are inevitable where it comes to economic development. It is important to make the landscapes safe for people and facilitate the utilization of damaged areas. It would be appropriate to start the projects for utilization of extensively damaged areas from areas surrounding Tallinn and Paldiski (Maardu and Männiku quarries, former military area in Pääsküla, former industrial regions) that could be used for the establishment of new industrial but to a certain extent also residential areas. Re-utilization of contaminated areas should be facilitated by subsidies paid to cover the costs arising from cleaning activities but also by relieving the landowner of any economic accountability related to former pollution. Such a policy will help to relieve the stress on natural and agricultural areas being occupied in the areas surrounding the town.

Energy sector is biggest user of water. In 2001, total water extraction abstraction in Estonia was 1,49 billion cubic metres (1080 cubic metres per capita per year). From surface water bodies, there was extracted 1,2 billion cubic metres (81% from total abstraction), including 1,1 billion cubic metres cooling water of power plants. The groundwater abstraction was 272 million cubic metres (18 % from total abstraction), including 217 million cubic metres of mining waters. Compared to previous year, mines pumped out 25 % less water due to closure of some mines. Despite the fact that nutrients (N, P) and organic load from energy production is relatively low, environment is negatively affected by alkaline waters from ash transportation of oil-shale power plants. Excess-water from ash-fields due to large rainfalls, has been time-to time pumped into Narva Water Reservoir, but thanks to the technical measures applied by Narva Power throughout last couple years, pollution of environment by alkaline water has stopped. Mining results in a lowering of the water table and an increase of SO4 concentration in groundwater up to 500 mg/l (normally 20 mg/l).

3.5 Waste Management

National Waste Management Programme (NWMP) based on EU directives 75/442/EEC and 91/689/EEC (which has been amended by Commission Decisions 2000/118/EC, 2001/119/EC and 2001/573/EC) has been completed. The Estonian Parliament approved the programme in December 2002. This programme establishes a basis for working out systematic solutions in the field of organisation and improvement of waste management, in order to create an adequate countrywide network of waste management facilities and

ensure the high environmental and health protection level of waste management. The NWMP includes:

- Description of the existing situation in waste management, main types and volumes of waste recycled and disposed of,
- Assessment of the quantity of natural resources necessary for waste management, impact of waste management on the state of the environment,
- Planned objectives, such as decrease of the quantity and hazardous nature of waste, recycling of waste, environmentally safe disposal of waste and optimisation of waste shipments,
- Means and measures for realisation of the objectives, such as the choice of waste management methods, network of waste management sites and facilities (including their location), special measures for the management of hazardous waste and other important types of waste, environmental and health protection measures and technological means for ensuring implementation of such measures; estimated cost of implementation of the measures,
- Transboundary optimisation of waste management and international co-operation in the field of waste management.

Waste management programmes of the counties should be revised in the light of the NWMP. Regional Waste Management Programmes are ordered by the Ministry of Environment.

The MoE continues development of Hazardous Waste Management System (HWMS) pursuant to the tasks provided in the Waste Act. HWMS includes:

- Three transfer/reloading stations in Tallinn (operational), Pärnu and Tartu,
- One Hazardous Waste Complex (transfer/reloading station and secure landfill) in Vaivara county (operational since October 2001),
- Temporary storage in Vaivara of hazardous waste which we are not able to manage in Estonia in the near future (pesticides and other hazardous waste),
- Incineration plant and special physical-chemical equipment for management of hazardous waste (in the stage of preparation, application for CF assistance will be presented to EU Commission approximately in December 2003),
- Hazardous waste collection stations in municipalities (more than 40 by the end of 2002),

- Closing of the Baltic Power Plant ash disposal number 2.

Construction of the hazardous waste landfill in Vaivara was completed in 1999 and it is operational since April 2000. The HWMS to date is still in initial stage due to the lack of financial resources.

All the planned efforts are followed by the investment programmes, where CF performs significant role in co-financing and CF pipeline includes several bigger projects both in municipal waste management as well hazardous wastes management.

The NES goals for the solid waste sector are:

- To reduce pollution by industrial and hazardous wastes,
- To reduce pollution by municipal solid wastes,
- To reduce pollution by out-of-date pesticides.

NES goals for the waste management sector were reinforced in the Draft National Waste Management Strategy and Action Programme (approved by the Government in May 1999), as follows:

- Waste collection services must be gradually expanded until they cover the entire population. Collection equipment and vehicles must be renewed to ensure compliance with the environmental, technical, economic and hygiene requirements for the waste management systems, and for the convenience of users,
- An integrated waste disposal network must be established, i.e. adequate facilities must be provided for safe disposal of all types of waste in the nearest facility,
- Only waste disposal facilities with the servicing area covering up to one or several regions are environmentally and economically feasible. Transfer stations should be established at towns and settlements while container bring-banks and stations should be established at villages located further away from big landfills,
- Landfill will remain the main type of waste disposal facility but all new landfills must be established in accordance with the requirements of the Estonian environmental standards and EU directives regulating waste management,
- Waste incineration for energy generation has a priority over landfill disposal. The possibility for such waste incineration for energy generation in large cities shall be considered upon detailed assessment of both environmental and economic factors,

- Funds required for the modernisation of the waste collection system, the establishment of new landfills, the closing down and recultivation of old waste disposal facilities shall primarily be collected from waste holders following the "polluter pays" principle.
- Energy production is extremely wasteful, providing 72% of the total waste generation in 2000. Out of 11.6 million tons of wastes generated in 2000, 5 million tons was oil-shale combustion ashes and 3.3 million tons was mining residuals.

Table 3.5.1: Waste generation in 1992-2000 (th t)

Year	Total	Vegetable Origin	Inorganic Waste	Chemicals and Chemical Products	Domestic Waste	Other
1992	15 232	939	12 866	920	306	201
1993	14 515	575	12 366	1 263	309	2
1994	14 160	629	11 553	1 284	392	302
1995	14 614	1 443	10 955	1 266	533	417
1996	15 191	942	11 899	1 325	565	460
1997	14 918	821	11 923	1 383	593	198
1998	13 487	959	10 773	1 003	557	195
1999	11 348	846	8 903	644	569	386
2000	11 616	534	9 378	1072	544	88

During the years 2001-2009 it is planned to construct approximately 7 new landfills for non-hazardous waste, and to close the old landfills for municipal waste with accordance to the requirements laid down in Article 13 of the Directive1999/31/EC. Timetable of implementation of Article 14c of Directive 1999/31/EC:

2002 Adoption of the NWMP by the Estonian Parliament. This Plan forms basis for implementing specific measures aimed at construction of new landfills, close and modernise the existing landfills, collection and reloading stations for recycling of household waste.

2001 - 2002 Classification of the existing landfills in compliance with the Article 4 of the Directive. The existing landfills are classified by Estonian Landfill Decree.

2002 - 2003 Preparation of conditioning plans for the existing landfills and taking a definite decision by the competent authorities about necessary measures for closing or modernising the existing landfills. In September 2001 enforced Estonian Landfill Decree.

2001 - 2009 Establishing of 5 or 6 new regional landfills and 1 landfill for isolated settlements:

1) for Tallinn in Jõelähtme - the first phase (ready to start deposition) will be built by the year 2004 and the second phase by the year 2010, serving an area of 500000 people,

2) Uikala landfill in North-Eastern part of Estonia - the first phase has been operational since January 2002, the second by the year 2008, in the first phase serving an area of 90 000 people and in the second phase of 165 000 people,

3) Paikuse landfill in Pärnu County - the first phase will be built with ISPA assistance by the year 2005, serving an area of 100 000 people,

4) Landfill for the South-Eastern part of Estonia - the first phase will be built with CF assistance by the year 2005, serving an area of 150 000 people,

5) Landfill for the North-Western part of Estonia - will be built with CF assistance by the year 2007, serving an area of 120 000 people,

6) Torma landfill in Jõgeva County - local landfill for some isolated settlements, built in 2001, serving an area of 20 000 people.

2001 - 2013 Closure and updating the existing landfills:

1) After enforcement of Estonian Landfill Decree 14 of the existing municipal waste landfills has been closed according to the requirements of Article 13 of the Directive in 2001. In 2002 began closing of the 48 landfills. According to the Estonian Waste Act the detailed implementation plans were drafted during 2002 in the Waste Management Plans of local authorities and counties. The most important municipal waste landfill is Pääsküla landfill in Tallinn. Preparations for closing this landfill are under way and the main closure procedure will start after finishing the first phase of the new landfill. The cost of closing of this landfill is estimated to be 11 million EUR and will be partly covered by ISPA,

2) Closure and modernisation of industrial waste landfills, particularly the landfills for oil shale waste. A detailed implementation plan will be prepared in 2003.

3.6 Nature Conservation

The use of natural resources and the extent of nature protection prescribed by law is monitored according to the stipulations of the Environment

Supervision Act and the Environmental Impact Assessment and Environmental Auditing Act.

The Riigikogu (Parliament of Estonia) has ratified the Berne (1979) Convention on Conservation of European Wildlife and Natural Habitats, (implemented in 1992), the Ramsar (1971) Convention on Wetlands of International Importance, Especially as Waterfowl Habitats (implemented in 1993), the Washington (1973) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (implemented in 1993) and Convention on Biodiversity (ratified and implemented in 1994).

Goals related to the protection of biodiversity are also reflected in the Environmental Strategy of Estonia (1997) and the consequent Estonian Environmental Action Plans (1998 and 2001). The Strategy and Action Plan for Protection of Biodiversity (1999) were prepared for the implementation of the Convention on Biodiversity. The selection of Natura 2000 protected areas has started for the organisation of protection of species and habitats under the nature-protection directives of the European Union. The selection is implemented in accordance with the approved national programme "NATURA 2000 in Estonia" for 2000-2007.

Estonia is making efforts to improve nature conservation and to meet the requirements of the EU Directives in this regard:

- Habitats (92/43/EEC) and
- Wild Birds (79/409/EEC).

3.6.1 Drafting of legislation 2001-2003

Export and import of endangered species is regulated by Regulation of the Minister of Environment establishing a list of, and a procedure for import into and export from Estonia of, protected species and fossils and hunting trophies for the import of which into and export from Estonia a special permit is required, which was approved on 25 September 2000. This Regulation established the list of CITES species as amended at the 11th Conference of Parties to the CITES Convention, the list of permits required, the forms of the permits, and the procedure for issuance of the permits. Sanctions for violating the rules established under the CITES Convention are set out in the Customs Act and the Criminal Code.

Scientific justification related to the amendments to the annexes to the Birds and Habitats Directives proposed by Estonia have been prepared using the data sheets provided by the Commission services. The data was submitted to

the Commission by the end of March 2000.

Transposition of the requirements of the Birds and Habitats Directives into Estonian legislation will be carried out in 2003. An Act on Nature Conservation, which considers all the requirements of the EU directives in the field of nature protection, is being drafted and will be adopted in II half of 2003. By this Act both of the above Directives will be transposed in 2003.

3.6.2 Implementation

NATURA 2000

NATURA 2000 is the most work-consuming part of the EU nature conservation legislation. Estonia has undertaken to establish the NATURA 2000 network for the date of accession, which means that the country has to submit to the European Commission by the end of 2002:

- A list of Special Protection Areas (SPA),
- A national list of proposed Sites of Community Importance (pSCI),
- The NATURA 2000 database on the above sites (including maps).

For the purpose of establishing the NATURA 2000 network in Estonia, the *National Programme "Estonian NATURA 2000" for the years 2000-2007* has been drawn up and approved by Order No. 622-k of 25 July 2000 of the Government of the Republic. The primary objective of the Programme is to establish in Estonia a NATURA 2000 network that meets the requirements of the EU Birds Directive and Habitats Directive. The Programme will be implemented in two stages.

The main objective of Stage I (2000-2002) is to draw up and submit to the European Commission a list of proposed Estonian NATURA 2000 sites (i.e. a list of SPAs and pSCIs), along with maps and database conforming to the EU requirements.

Specific objectives of Stage I are as follows:

- Preparation of annotated translations of the Birds Directive and Habitats Directive;
- Preparation of guidelines for filling in the NATURA 2000 standard data form;
- Preparation of an Interpretation Manual of EU Habitats for Estonia;
- Preparation of the list of proposed NATURA 2000 sites;

- Establishment of NATURA 2000 database;
- Mapping of boundaries of proposed NATURA 2000 sites;
- Organisation of temporary protection of proposed NATURA 2000 sites;
- Estimation of conservation management costs of proposed NATURA 2000 sites;
- Training;
- Introduction of the objectives of NATURA 2000 to the public.

The Programme includes a detailed action plan for Stage I (2000-2002), which indicates the activities necessary for the implementation of the programme, establishes a time schedule for the activities, identifies the main implementing agencies, estimated costs and sources of financing. Action plan for Stage II will be drawn up in the course of Stage I.

The objective of Stage II (2003-2007) is to organise actual protection of NATURA 2000 sites in conformity with the EU requirements. This includes designation of protected areas, determination of protection measures, drawing up of management plans, concluding contracts with land owners, and also application of other measures as appropriate (incl. spatial planning tools) to ensure a favourable conservation status of the habitats and species occurring in the NATURA 2000 sites.

At present there are 318 protected areas in Estonia. New Protection Rules have been approved for 114 of these during the years 1994-2000 (i.e. after the *Protected Natural Objects Act* was passed). The territory of these protected areas makes up four fifths of the total area of protected areas in Estonia. The process of preparing new Protection Rules for protected areas will be completed in the coming few years. The total area of protected areas in Estonia is approximately 520,000 hectares. Management plans are planned to be drawn up for national parks, nature reserves, Ramsar sites and, if necessary, also for protected landscapes. For steering this work, a special committee has been established at the Ministry of the Environment. To date, management plans of four protected areas have been approved (Soomaa National Park, Alam-Pedja Nature Reserve, Matsalu Nature Reserve and Põhja-Kõrvemaa Protected Landscape), further two management plans have been drawn up (for Piusa Caves Nature Reserve and Õisu Protected Landscape) and are expected to be approved at the end of 2000. Management plans for 7 more areas have been approved in 2001 by ministerial regulations.

The Estonian Ornithological Society is currently carrying out the identification of Important Bird Areas (IBA). Fifty three IBAs have been identified in Estonia to date. These areas constitute a good basis for the establishment of the

NATURA 2000 network, yet they still need to be inventoried against the requirements of the Birds and Habitats Directives. This has been done by end of 2002.

Sites hosting habitat types and species of Community importance but located outside of protected areas has been inventoried by 2003 for the purpose of identifying sites suitable for inclusion in the NATURA 2000 network. For sites to be proposed for inclusion in the NATURA 2000 list, data necessary for filling in the standard data form has to be finalised and maps has to be drawn up.

4. FINANCING OF ENVIRONMENTAL PROJECTS

All the projects which will be funded by European Union have to be co-financed by the beneficiary country.

Ownership and sustainability of the project is assured by co-financing from the funds of Final Beneficiary. The financial analysis which is an essential component of the project applications forms the basis for the calculation of the grant rate. The grant rate is also dependent on the "Polluter-Pays Principle" - during the preparation of investment application the Final Beneficiary has to point out whether the principle is respected or not (*Article 130r Treaty EC, and Article 15 Council Directive on waste 75/442/EEC*).

Domestic funds for environmental protection in Estonia come from four main sources:

- The State Budget,
- Local budgets (finances allocated to and raised by the municipalities),
- The Environmental Investment Centre,
- Private capital.

The key problem of co-financing the investment projects in Estonia is that the municipalities (who are the Final Beneficiaries of the projects) are small and not capable to find the financial resources in their budgets.

As mentioned earlier as regards Directive 94/63/EC on the control of volatile organic compound emissions resulting from the storage of petrol and its distribution from terminals to service stations, mostly owned by private sector. The owners will do financing of related projects.

Estonia's Environment Fund was overhauled in 1999-2000, and Environmental Investment Centre (EIC) as the successor was established in June 2000. EIC continues the work of former Environmental Fund: raises funds from fees for the use of natural resources and fines for pollution. Revenues raised by the EIC are earmarked for environmental protection projects (mainly infrastructure).

From June 2001 EIC has been acting as an Implementing Agency for ISPA Environmental Projects and is responsible for following tasks:

- Prepares and organises tender documentation and implementation,
- Prepares the contract, payment orders,

- Verifies the works (with assistance of Employer's Representative, or Site Engineer, or an independent audit),
- Verifies reports and sends to Sectoral Authorising Officer (SAO) for endorsement.

Beginning from February 2002 the EIC is also acting as an on-lending agency providing loans for municipalities for co-financing ISPA Environmental projects. There has been achieved agreements with Ministry of Finance and International Financial Institutions (IFI) for on-lending state guaranteed loans of 14 million EUR of Nordic Investment Bank to Estonian municipalities in order to guarantee the obligation of co-financing. In addition there are ongoing negotiations also with the European Investment Bank. The above-mentioned sums cover only the co-financing of first ISPA grants, afterwards there will be concluded new agreements with IFIs for additional sums. As regards the CF project implementation the EIC will continue its work as Implementing Agency.

When looking at donor support to the entire environmental sector in Estonia (not just infrastructure), it is remarkable to note that donors have contributed a total of EUR 63,4 million over the nine-year period 1991-2000 (see Table 4.1.1). However, as recent studies of the costs of approximation in the environment sector have shown, a lot more money is needed from a variety of sources.

Table 4.1: Environmental Sub-Sector	**EUR**	**Number of Projects**
Water Resource Protection and Management	10 093 809	34
Water Supply and Wastewater	24 976 160	60
Waste Management	5 850 963	32
Air Protection	4 705 548	12
Forestry Development	1 356 449	3
Fishery Development	442 066	4
Environmental Policy and Administrative Management	6 575 071	33
Biodiversity	2 456 903	9
Environmental Education/Training	6 108 910	33
Approximation of Laws	963 318	3
Other	3 415 953	26
Total	**157 782 150**	**216**

5.RATIONALE FOR SELECTION OF PROJECTS FOR CF

5.1 General

The criteria for selecting priority areas for investment is as follows:

Projects which comply with EU environmental policy objectives:

- Projects, which are in accordance with overall priorities on Single Programming Document 2003-2006
- Preserving, protecting and improving the quality of the environment,
- Protecting human health,
- Prudent and rational utilisation of natural resources,
- Projects which comply with EU environmental principles:
- Precautionary principle,
- Preventive action,
- Damage rectified at source,
- Polluter pays,
- Projects which are a priority in the National Programme for the Adoption of the *Acquis* (NPAA) and will help the country to comply with the most investment-intensive Directives,
- Projects designed to comply with EU technical specifications and quality standards and will operate within an adequate legal and administrative framework,
- Projects which can demonstrate quantitative reductions in pollution for a maximum number of people (thus producing an effect of scale),
- Projects which best serve the protection of human health,
- Projects which will support the implementation of the National Environmental Strategy in those areas where it is compatible with the Accession Partnership, NPAA and the provisions of the CF regulation,
- Projects which have the potential to stimulate strong partnership between central government and regional and local authorities,
- Projects situated in environmentally sensitive areas, supporting the protection of ecosystems of extraordinary value from the point of view of nature protection and biodiversity,

- Projects which have the best potential to contribute to gradual achievement of economic and social cohesion of Estonia with the EU (showing the highest net economic and social benefits),
- Projects which meet the CF threshold of EUR 10 million capital costs,
- Projects which reduce the spatial concentration of the pollution sources
- Projects which are for the preparation of projects financed from the Cohesion Fund.

5.2 Estonian Planning and Development Considerations

The selected projects should:

- Comply with the environmental policy goals and tasks of the National Environmental Strategy (as listed in Chapter 3 of current document),
- Form priorities under the National Environmental Action Plan,
- Be coherent and part of the National Programme on Reduction of Emissions of Pollutants from Large Combustion Plants,
- Be coherent and part of the Global water Partnership of 1999,
- Have positive impacts on the maximum number of people (economies of scale),
- Require CF support (cannot be implemented or will be unacceptably delayed without CF support due to a lack of state and private funds and lack of ability to repay larger loans),
- Improve human health,
- Encourage co-operation between central government and regional and local authorities,
- Protect environmentally sensitive areas and meet the requirements stipulated by Urban Wastewater Directive (91/271/EEC) and HELCOM recommendations,
- Be well timed and ready for effective development and implementation (management capacity) at the appropriate stage.

5.3 EU Accession Considerations

Projects should:

- Have a measurable impact on Estonia's efforts to achieve "substantive approximation",
- Conform with Accession Partnership criteria,
- Form an investment-intensive priority under the National Programme for the Adoption of the *Acquis* (NPAA),
- Address EU Directives where Estonia has requested transitions or taken obligations
- Comply with EU environmental policy objectives (preserving / protecting environmental quality, protecting human health, encouraging sustainable development),
- Be coherent and part of Directive-specific implementation programmes (like NWMP, derived from the Waste Directive etc.),
- Comply with EU environmental policy principles (polluter pays principle, precautionary principle, preventive action),
- Contribute to Estonian economic and social cohesion with the EU.

Of particular interest will be projects proposed by several municipalities or by authorities connected with coherent environmental systems, such as sub-river basins. This should allow creating larger, more complex and coherent projects, with a higher budget - easier for handling and supervising.

5.4 Environmental goals for 2000-2006

Priority from the beginning of this period will be given to water supply and wastewater treatment projects and solid waste management projects. In addition to the investment projects in water and waste sectors, from year 2002 more attention will be given also to the air sector investment projects. Preparation of the investment projects is co-financed from ISPA TA.

CF grants for projects may reach up to 85% of the share of required public expenditures. Supplementary investment from public sources will be available in the form of grants from national budget, municipal budgets and environmental funds, but also foreign grants and loans for environmental protection.

Air protection:

- Transposition of EU air quality requirements (e.g. supervision and monitoring of the pollutants characterising ambient air quality and making

the information available for the public),

- Development of air quality improvement plans (e.g. establishment of a Air Quality Management System),
- Modernisation of air quality monitoring networks (e.g. reduction of negative environmental impact of energy sector, including energy conservation, renewable energy use. Reduction of negative environmental impact of other industrial enterprises),
- Development and start of implementation of persistent organic compounds, heavy metals, volatile organic compounds, greenhouse gases and pollutants from large combustion plants reduction programmes,
- Development and start of implementation of VOC reduction programmes,
- Ensuring of fuel quality (e.g. development of Estonian Fuel Quality Monitoring and Inspection System).

Water supply and wastewater sectors:

- Transposition of EU requirements,
- Development of implementation programmes,
- Development of detailed plan for each municipality for the implementation of the requirement in water sector,
- Preparation of feasibility studies for the upgrading of the water supply, sewage systems and sewage treatment plants,
- Launch of construction/extension of priority water treatment and supply systems, sewage treatment works and sewerage systems,
- Establishment of river basin management institutions, implement institutional strengthening programmes,
- Development and implementation of water quality monitoring programmes,
- Development of information management and reporting capacities.

Waste Management:

In the solid waste sector, investment projects for waste management will be planned taking into consideration goals set in the *acquis*.

- Complete transposition in waste management sector,
- Strengthening of waste management institutional capacities,

- Development of national and municipal waste management plans,
- Launch of construction of priority regional landfills,
- Closure of old landfill sites according to foreseen programmes,
- Extension of waste recovery and recycling capacities.

6. PRIORITY PROJECTS FOR CF FUNDING

6.1 General

As described above, Estonia has a number of environmental problems in water and waste management sectors, which require urgent solution. Related investment projects are different in both size and potential impacts on the quality of the environment. However, there are also smaller municipalities with environmental problems to be solved. Despite their more local impacts, they still affect the environmental quality targets, in particular surface water quality.

Past environmental and investment policies, the size of the country and municipalities have resulted in the situation that Estonia has a number of large-scale investment projects as well as a considerable quantity of smaller projects. Therefore, in order to address environmental problems in a comprehensive way, it will be necessary to implement a number of smaller projects, which alone will not meet the 10 million Euro thresholds. Ignoring of smaller projects will cause inability to achieve environmental goals in wholeness and will reduce effectiveness of other projects in the region. ISPA TA will be used for the preparation of projects for the Cohesion Fund.

6.2 Pipeline Development

The CF project pipeline, shown in Annex I, is a logical progression in the work of the Estonian Ministry of Environment over the last five years, in consultation with other Ministries, local and County Government, public bodies and public representatives. In addition, the pipeline was developed in line with the Accession Partnership and Estonia's position on EU Membership (Position Paper).

All public priority investments are covered by the Environmental Protection Programme which includes projects to be financed from the means of the Environmental Investment Centre (EIC), loans and grants taken on behalf of the State, foreign loans guaranteed by the State and earmarked funds in Municipal Budgets. CF projects form integral part of Environmental Protection Programme.

A basic criterion for selection of the projects is that the project will achieve full compliance with relevant EU Directives at its final phase.

Annex I indicatively lists priority projects for investments, which have been selected in relation the following criteria and priorities:

6.3 Air quality

Criteria for project selection in air quality sector:

- Environmental effects,
- Large agglomerations,
- Implementation of air quality improvement plans in areas where the permissible air quality standards are exceeded,
- Health effects,
- Implementation of the 'polluter pays' principle.

Priority projects:

- Introducing more efficient, less fuel consuming and less polluting technologies. Renovation and construction of systems for minimise pollutants from ambient air in enterprises having exceeded the limits established for pollutant emission, including implementation of Best Available Technique,
- Reduction of SO2 and other substances, use of environmentally friendly fuels,
- Energy efficiency projects, that enable to reduce pollution load in large settlements.

6.4 Water supply and wastewater

Criteria for priority setting in the water supply and wastewater sectors:

- Environmental effects,
- Large agglomerations,
- Discharges in sensitive areas,
- Discharges in vulnerable areas,
- The potential effect on the sources of drinking water,
- Service improvements for water utility consumers,

- Connection of new consumers,
- Implementation of polluter pays principle,
- Considerable economic effect,
- Competitiveness of industrie,
- Health effects.

Priority projects:

- Connection of household consumers to water and waste water networks in bigger settlements for ensuring the quality of water and protect water bodies,
- Reconstruction and building of new waste water treatment plants and collectors to decrease the figures of wastewater treatment indicators,
- Reconstruction water networks for decreasing of leakages for rational use of water,
- Ensuring biological and if necessary chemical treatment of wastewater contaminating the environment,
- Renovation and construction of manure and slurry storages implementation environmentally friendly fertilisation technologies in nitrate vulnerable zones,
- Treatment of past pollution near aquifers.

6.5 Waste Management

Criteria for project selection in solid waste management sector:

- Environmental effects,
- Availability of regional and municipal waste management plans,
- Implementation of waste management policy principles,
- Regional waste management facilities,
- Regional landfills in accordance with the EU requirements,
- Health effects,
- Protection of sensitive areas,
- Implementation of polluter pays principle.

Priority projects:

- Construction of new regional landfills,
- Closure or updating of existing landfills,
- Increase of recycling of waste to 30-40%,
- Building of hazardous waste complex (transfer/reloading station and secure landfill), collection and reloading stations and incineration plant (incl. special physical-chemical equipment for management of hazardous waste),
- New technologies of handling and dumping of oil-shale ash.