LITHUANIAN ENVIRONMENTAL STRATEGY

ACTION PROGRAMME

MINISTRY OF ENVIRONMENT OF THE REPUBLIC OF LITHUANIA

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FOREWORD

Throughout the world today, environmental issues are attracting increasing concern as countries understand that economic development must be founded on good environmental principles. Economic and social progress depend on caring for the Earth, on protecting landscape diversity and biodiversity, and on a rational use of natural resources.

Together with other countries in the world, Lithuania has selected the path of sustainable development, a significant step on the way being the preparation of a national environmental protection strategy. The Lithuanian Environmental Strategy addresses both the policy formation issues and actions aimed at attaining the set priority objectives.

The Ministry of Environmental Protection will make every effort to ensure that the Strategy is implemented, and every person and organisation in Lithuania is encouraged to study this document with care and come back with proposals finding ways to help realise its aims. Shared responsibility and partnership are key principles identified by the European Union as vitally necessary to resolve environmental problems. These principles are among those adopted in the implementation of the Lithuanian Environmental Strategy.

It is our hope and belief that this document will encourage us to act together in cherishing and taking care of our home - the environment of Lithuania.

B.Bradauskas
Minister for Environmental Protection,
Republic of Lithuania

CONTENT

Addendum to
the Lithuanian Republic Parliament
Decree No I-1550
25 September 1996

1. INTRODUCTION

Lithuania's Environmental Protection Programme developed in 1992 included all major environmental problems of the day highlighting ways of addressing them in priority order. Most of the measures included in the Programme have already been implemented, some are still in the phase of implementation. However, the national economy development policies, economy restructuring and the urgency to address some environmental problems have put forward a demand of setting new environmental policy goals and priorities, of selecting most effective ways to achieve them. Therefore, a new Programme was worked out in 1995 consisting of three volumes. Volume one - "Strategy Motivation" - contains the present environmental status assessment, national economy sectors' review, environmental change trends' forecast, a description of the institutional, legal and economic system in the environment sector. Volume two - "Strategy Methodology" - formulates the Strategy concept based upon environmental status analysis, presents the techniques selected for the assessment of environmental problems, their urgency and implications, outlines priority goals. Volume three - "Action Programme" - presents the long-term strategy, and short and medium-term Action Programme in relation to environmental components. Also, it includes strategy implementation means, environmental protection funding aspects, etc.

The present document contains the main statements of the national environmental protection strategy.

2. ENVIRONMENTAL STATUS REVIEW

Information on environmental status, on changes both positive and negative are presented in volume 1 of the Strategy - "Strategy Motivation" - also, it can be found in annual Reports of the Environmental Protection Ministry. Therefore, only a brief review of the environmental status is presented below.

2.1. Environmental Quality

Water. In 1995, approximately 300 million m^3 of untreated waste water were discharged to surface water bodies - 26 percent of this amount were treated to reach the requirements of discharge standards, 56 percent were insufficiently treated and 18 percent were discharged untreated (Fig. 1). The main cause of surface and ground water contamination is insufficient treatment of municipal and industrial waste waters as well as non-point source pollution.

Compared to 1992, these figures changed due to a reduction of waste water discharge and implemented treatment measures. In 1992, the total amount of waste water discharged into water bodies was 366.3 million m^3, out of which 69.7 million m^3 were discharged untreated, 95.6 million m^3 were treated to meet the standards and 201 million m^3 were treated insufficiently.

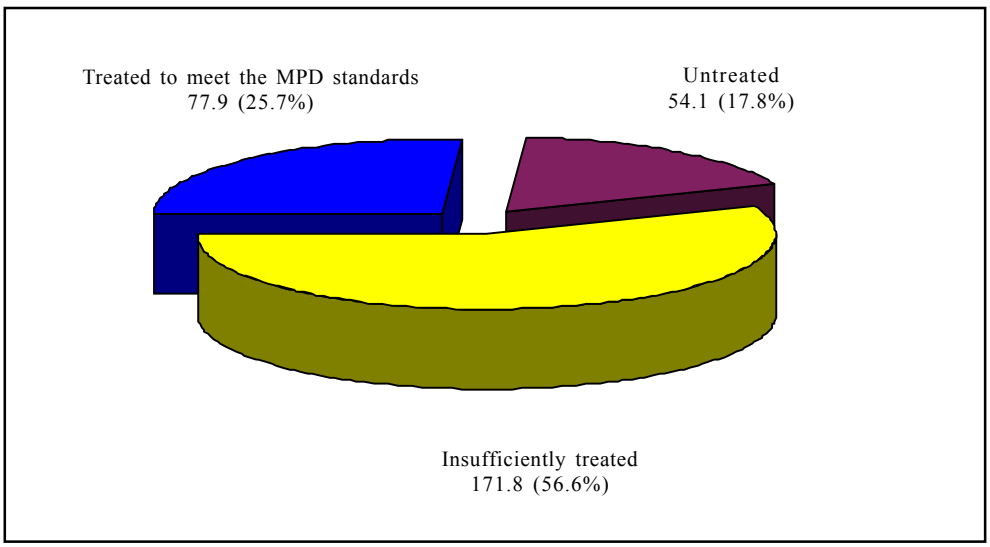

Fig. 1. Waste water discharge in 1995, million m^3 (percent)

Surface water quality is monitored by performing water quality analyses in 47 rivers and 9 lakes, at the points which most characteristically reflect impacts of municipal, industrial and farming activities. Natural background concentrations are observed in 6 smaller rivers least affected by economic activities. In 43 percent of monitored rivers water was found to be clean, in 48 percent - polluted at medium level, in 9 percent - heavily contaminated. Of smaller rivers, the Sidabra, Kulpe, Obele, Tatula and Laukupe are heavily polluted: average concentrations of organic substances exceed standard limits as many as 10 times, those of nitrates - up to 13 times, ammonium, nitrogen and phosphates up to 26 times. Hydrochemical parameters indicate that lake water is clean, whereas hydrobiological and bacteriological tests show slight or average contamination.

About 80 percent of the Kursiu Lagoon and 45 percent of the Baltic Sea coastal waters are heavily polluted with nitrogen and phosphorus. Often, particularly during algae blooming, oxygen deficit resulting in mass fish deaths is observed. The Nemunas basin rivers' as well as the Kursiu Lagoon water mass impact upon the Baltic Sea can be easily traced at a radius 10 to 15 km from the Klaipeda Straits. During the hot days of summer season the sanitary status in the beaches of Klaipeda, Giruliai and Palanga is below standards.

Ground water pollution has been detected in almost one third of the country's area. Around 800 thousand inhabitants consume water from dug wells where nitrates exceed permitted limits. In some localities, such as the site of Jonava Achema Company, or oil storage facilities in Vilnius, Alytus, Marijampole, Svencionys as well as the former Soviet military sites' ground water is heavily polluted with nitrates 30 to 120 times exceeding the Highest Permissible Concentrations (HPC); and oil products. Ground water in the karst region in northern Lithuania contains increased amounts of both nitrogen compounds and organic substances.

Air. In recent years atmospheric pollution in Lithuania has decreased. Problems, however, such as acid rain, ozone layer depletion, climate change which are typical for most countries are characteristic for Lithuania, too. Like in most other countries, transport, energy and industry are major air pollution sources in Lithuania. As can be seen in a diagram (Fig.2), the biggest source of air pollution are transport emissions: around 70 percent in 1995, an increase by 11 thousand t as compared with 1992.

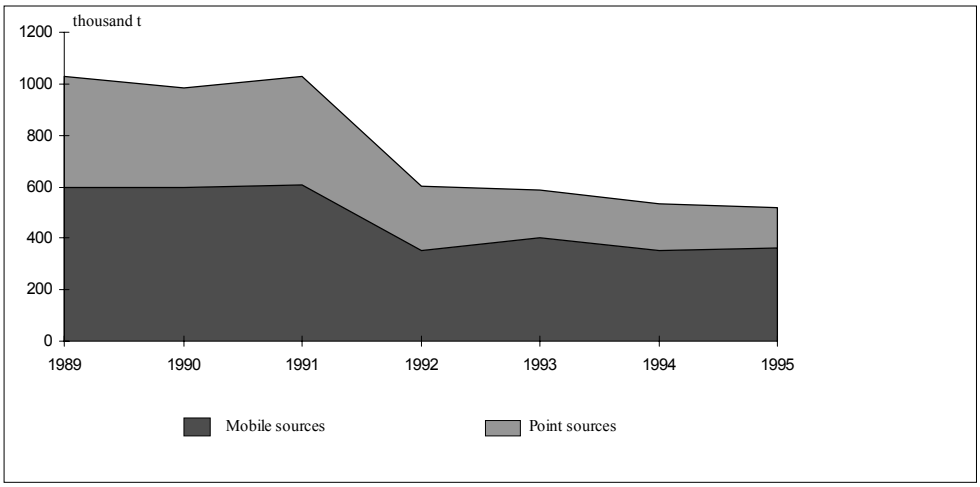

Fig. 2. Variations of air emissions from point and mobile sources

The main sources of air emissions are in cities and industrial centres, such as Vilnius, Kaunas, Klaipeda, Naujoji Akmene, Mazeikiai, Kedainiai, Jonava, etc. In 1995, about 514.7 thousand t of pollutants were generated from point sources of which 152.1 thousand t were discharged into the environment. Today pollution from stationary sources tends to decline, however, since 1995 emissions in some industries have been increasing together with production growth, e. g. in Jonava "Achema" Company, Panevezys "Metalistas", Kedainiai "Fostra", etc.

Soil. Soil and the upper ground layer is most heavily contaminated in cities, especially in industrial areas, near highways and flyovers. Heavy metals concentrations in soil and oil products content in some industrial areas are beyond highest permissible levels. Heavy metals concentrations in soil exceeding background concentrations are found even outside the territories of these companies. For instance, increased amounts of nickel and vanadium have been found in the impact zone of Mazeikiai Oil Refinery, fairly high chromium, nickel and vanadium concentrations are characteristic of the environs of Naujoji Akmene Cement Company, copper concentrations are beyond standard levels in the impact zones of Jonava and Kedainiai fertiliser companies. Benzapyrene and lead accumulations are found near roads, particularly where traffic is heavy.

Concentrations of pollutants in cultivated soils are rarely beyond highest permissible levels. Intensive land cultivation provides favourable conditions for mechanical and water-caused soil erosion and depletion.

Waste. Waste generation trends are shown in Figure 3.

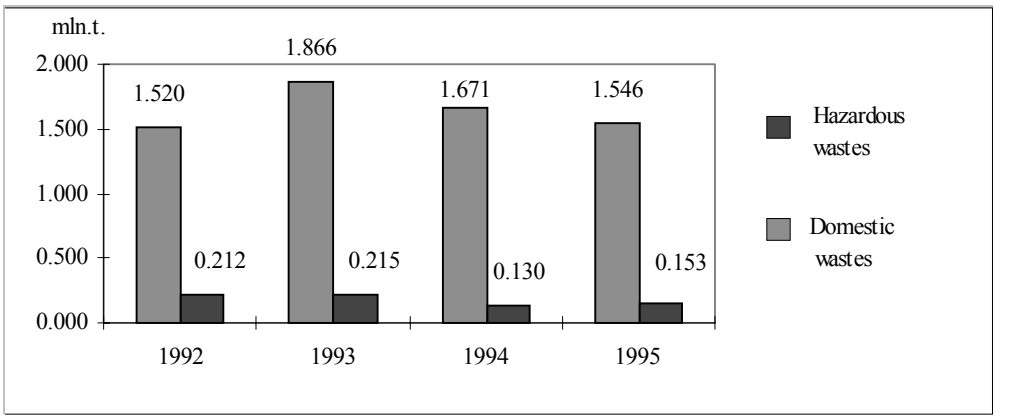

Fig. 3. Domestic and hazardous wastes generation trends.

Domestic wastes stream is noticeably growing due to an increasing use of food products' and household goods' packaging, particularly disposable packaging. Domestic wastes are practically not sorted out, thus nearly all are dumped.

In 1995 in Lithuania 153 000 t of hazardous wastes were generated. Prohibited and old pesticides represent a specific problem. Today 954 storage facilities contain around 4000 t of pesticides of which nearly 2200 t have been attributed to either prohibited, old or unidentified ones. During 1989-1995, 26 pesticide storage facilities were on fire. 1700 t of hospital waste after disinfection are taken to domestic waste dumping sites together with other domestic wastes. The situation is even more complicated as regards other hospital wastes. Annually in Lithuania over 1 million of used mercury lamps are accumulated.

Radioactive wastes are accumulated at Ignalina Nuclear Power Plant. Smaller amounts of radioactive wastes are generated by hospitals, industries, research institutions and companies. Spent fuel at Ignalina NPP is stored in reservoirs near reactors. Solid radioactive wastes generated during the power plant operations are sorted out depending upon their radioactivity and are stored in specially designed storage facilities. Waste water sludge containing radioactive nuclides is stored in a quarry. Per year about 0.4-0.65 GBq of artificial radionuclides are accumulated.

Physical pollution. Radiation, electromagnetic fields, thermal pollution and noise are most characteristic physical pollution manifestations, their impacts upon environment traced and registered. Ignalina NPP is the main potential radioactive pollution source in Lithuania. Radioactive gases from operations buildings are emitted into the atmosphere together with air.

Television and radio stations, radars in airports and communications systems, military and civil radio communication systems are all sources of electromagnetic radiation. There are localities in Lithuania where electromagnetic field streams exceed the set standards.

Ignalina NPP operating full capacity, the cooling lake temperature goes up by three degrees due to the discharged water temperature. Thermal pollution has a significant impact upon the lake ecosystem; eutrophication is ever increasing.

Transport and industries are not only the major air polluters, they are noise sources, too. In certain areas in cities noise levels are beyond hygiene standards, therefore, preventive measures are urgently needed to avoid big investments in future as noise levels will grow.

Contamined sites. Among most contaminated areas are those around old dumping sites, including unofficial ones, the former Soviet military sites and training grounds as well as some industrial areas. The former Soviet military sites alone cover 67762 ha or 1.04 percent of the country's territory. It has been found that in injured sites, soil erosion and depletion, pollution with oil products and heavy metals continues. Also, unkempt dumping sites and severely injured forests, violated landscapes and destroyed recreational resources were found. The dumping sites' inventory compilation revealed pollution with nutrients, oil products and heavy metals.

2.2. Natural Resources, Landscape and Biodiversity

Land use structure formation. Land use in Lithuania has gone through several periods of historic development when due to land reforms (valakas, farmstead-based, and Soviet) its structure changed by a proportionate increase or decrease of specific land use groups. Currently Lithuania is undergoing another land reform changing the Soviet-type land use structure into one based upon small privately owned plots.

Intensive economic, primarily construction activities cause a decrease in the total area of natural and semi-natural territories, speed up landscape degradation and changes in its structure. The same tendencies can be observed in protected areas.

Human activities cause degradation and destruction processes in the natural soil layer. Among such processes is erosion caused by water and wind resulting in degraded, medium-level or heavily destroyed soils which account for over 1.6 percent of the country's area.

Protection of biota resources. Biota resources are main forest (timber) and supplementary forest (berries, mushrooms, wild fruit, medicinal plants) resources including wildlife. During the recent decade forests degradation increased, the main reasons being atmospheric pollution and unfavourable natural conditions, such as strong winds, draughts, increasing numbers of pests and hoofed animals. During recent years fish resources have practically remained stable, whereas hoofed animals have been decreasing in numbers: elk population has diminished more than twice, and the quality of the population has deteriorated. Of late, secondary forest resources have diminished both in area and quality.

Still, Lithuania can boast a fairly large number of natural and semi-natural territories which are home for such plant, animal and fungi species which have since long become extinct in developed Western European countries. Unfortunately, some are already threatened by degradation or total destruction. Biodiversity is diminishing.

Protection of recreational environment. Recreational areas account for about one third of Lithuania's area. Most attractive for holiday-makers and mostly visited are: the Baltic Sea coast, eastern Lithuania's lake district and suburban zones around cities. Lithuanian coastal zone is a mere 0.8 percent of the total recreational area, however, it is under the heaviest recreational load - 15 percent of the total visits. Protective sand dunes suffer most from intense recreation, environment is polluted, green plantations are degrading. Recreational territories abounding in lakes and forests are mostly violated by urban development, primarily near lakes. The major problem concerning recreational rivers is water pollution resulting in a loss of natural recreational attractiveness. Suburban zones, where community gardens change into dwelling areas, gradually turn into urbanized landscape changing its picturesque character, especially near water bodies. Land reform has been a hindrance to the protection of most valuable recreational resources, sometimes totally obstructing it.

Protection of lithosphere. Typical gravel and sand quarries in Lithuania are located in aforested hilly landscapes or river valleys, whereas peat-bogs usually lie in watersheds, i. e. in geoecologically sensitive zones within the nature frame territories. Exploitation of mineral resources has adversely affected 0.5 percent of Lithuania's territory. Mainly this refers to the exploitation of peat-bogs. At present 10.2 thousand ha of peat-bogs and 3.3 thousand ha of building materials quarries need urgent rehabilitation. Another problem is abandoned sites where mineral reasources used to be excavated in the former agricultural companies: over 3 000 ha of land were damaged. During the recent 5 years not a single peat-bog has been rehabilitated.

Water resources protection. Lithuania's hydrographic network is largely constituted of regulated river segments and land reclamation channels. Natural river and rivulet stretches account for a mere 15 per cent of the total length of watercourses.

Today the major consumer of surface water is Ignalina NPP as are Kaunas HPS and Kruonis HAS. There are 12 smaller power stations in Lithuania. About 4.58 billion m^3 of water are annually taken out from the country's water bodies for domestic and industrial needs. Of this amount over 300 million m^3 is ground water. The major part of water - 91.8 percent - is used for energy needs. Industry consumes 1.1 percent, 4.4 percent go for domestic needs and 2.6 percent of water is used in fishery ponds.

At present about 1 million m^3/day of fresh ground water is extracted. Water extraction is concentrated in the environs of Lithuanian cities. A day, about 1.5 thousand m^3 of mineral water are extracted to meet the demands of health resorts. Today's fresh water extraction constitutes about 30 percent of its total resources. From 1993 to 1995 ground water consumption decreased by 22 percent.

3. ENVIRONMENTAL PROTECTION GOALS

The Lithuanian Environmental Strategy is aimed at preconditioning the country's sustainable development to allow the preservation of clean and healthy natural environment, biological and landscape diversity and optimal nature use.

3.1. Environmental Quality Protection by Sectors

Water protection:

- reduction of surface water pollution with municipal and smaller settlements waste waters,
- reduction of pollution with industrial and agro-industrial waste waters,
- reduction of ground water pollution,
- reduction of non-point source pollution to water bodies,
- reduction of pollution with surface (storm water) run-off,
- reduction of pollution load into the sea,
- prevention of sea water pollution in oil products transportation,
- reduction of polluted water in-come from other countries.

Air protection:

- reduction of pollution from transport exhaust gases,
- reduction of volatile organic compounds emissions from point sources,
- reduction of the use of ozone depleting substances and their emissions,
- reduction of pollution with suspended solids,
- reduction of SO_2 and NO_x long-range transboundary pollution.

Protection of soil from pollution:

- reduction of soil pollution with organic and mineral fertilisers and other agricultural chemicals,
- reduction of soil pollution with oil products,
- reduction of soil pollution in cities and industrial areas,
- reduction of soil pollution with heavy metals.

Waste management:

- waste management system creation,

- reduction of environmental contamination with industrial and hazardous wastes,
- reduction of pollution with domestic wastes,
- taking care of prohibited and old pesticides,
- regulation of radioactive wastes management.

Protection from physical pollution:

- reduction of noise levels in cities,
- prevention of radioactive threats posed by Ignalina Nuclear Power Plant,
- Reduction of radioactive environmental pollution.

3.2. Protection of Natural Resources, Landscape and Biodiversity

Land use structure formation:

- optimisation of the general land use structure,
- prevention of further natural landscape degradation in the nature frame territories and those under protection, in cities and towns,
- prevention of further karst region and wetland landscapes degradation,
- optimisation of protected areas network.

Biota protection:

- prevention of further plant, animal and fungi species and populations degradation,
- optimisation of forest structure,
- optimisation of the use of wildlife resources,
- prevention of further degradation of river valleys and lakes as well as marine biocenoeses.

Protection of recreational environment:

- prevention of further degradation of recreational agrarian environment,
- prevention of further sea beaches and sand dunes degradation,
- prevention of further urban development in the most picturesque natural areas, primarily construction activities in the coastal zone, namely, in beaches, dune chain, on the front and back lines along the dunes and the cliff.

Lithosphere protection:

- renaturalisation of used quarries,
- reduction of a negative impact upon the environment from oil extraction, from transportation of oil and oil products and their sales,
- prevention of a negative impact upon the environment from the use of geothermal energy,
- prevention of a negative impact upon the environment from the exploitation of other mineral resources.

Water resources protection:

- protection of fresh water resources from over-use while extracting water from water in-take sites,
- prevention of further changes of natural hydrographic network structure.

4. ENVIRONMENTAL PROTECTION PRIORITIES

4.1. Preservation of Environmental Quality, Natural Resources, Landscape and Biodiversity

Environmental quality and other factors' assessment clearly indicate that priority problems to be addressed are: water and air quality, waste management, preservation of natural resources, landscape and biological diversity.

Waste water treatment and reduction of discharges. Domestic waste waters in cities, with the exception of Panevezys, are discharged into rivers only mechanically treated or after insufficient biological treatment; in Kaunas city - totally untreated. After biological waste water treatment is introduced in Vilnius, Klaipeda, Siauliai, Palanga and waste water treatment plant in Kaunas starts operating it can be expected that only 1 percent of waste water will remain untreated. Therefore, construction of waste water treatment facilities remains the highest priority for investments, particularly for funds from State budget, and loans and subsidies received by the State. Alongside, it is necessary to implement measures for the reduction of non-point source pollution of ground and surface waters and gradually restructure the financial mechanism for waste water sector by the introduction of polluter/consumer pays principle; and develop the necessary water protection laws.

Air pollution reduction/stabilisation. Environmental status analysis has revealed two main trends: (1) increasing transport emissions, (2) increasing pollution from industrial and energy objects which are increasing their output. In order to at least prevent the situation from getting worse so that permissible levels emissions and concentrations are not exceeded and international agreements on air protection followed, urgent measures should be resorted to. For the reduction of air pollution from mobile sources it is necessary to solve the fuel quality issue and gradually shift to vehicles which meet the EU standards, introduce optimal transport streams regulation systems, implement other measures aimed at the reduction atmospheric pollution. For the regulation of air pollution from energy sector and industries, it is necessary, following the European Union standards, to faster proceed with and finalise the development of legislation for the regulation of emissions, to implement energy saving measures, promote the use of cleaner fuels and the introduction of advanced production and pollutants treatment technologies. For enforcement purposes

it is necessary to revise the financing scheme for environmental protection measures, to establish an environmental investment fund, thus providing more favourable conditions for the implementation of environmental protection measures.

Waste management. The research carried out as well as international experience show that best results in waste management can be achieved by a parallel implementation of the following principles:

- avoidance of waste generation,
- reliable waste register and control,
- waste management and recycling,
- safe storage and disposal.

The main principle for the reduction of wastes is their avoidance. It can be achieved only by way of introduction of low-waste technologies and by using multiple-use packing. In waste management it is important not to mix different wastes. When mixed, their recycling or any other secondary use becomes problematic, they pose more danger and become more hazardous. In separating wastes it is important to separate secondary raw materials. Wastes in dumping sites should be securely disposed, substances which leak out and affect the environment should be collected, including biogas. For air, ground water and landscape protection from pollution, it is necessary to rehabilitate closed dumping sites.

Hazardous wastes management. Prohibited and old pesticides, mercury lamps, galvanisation and hospital wastes, soil contaminated with oil products and other hazardous wastes after their dumping in municipal dumping sites was prohibited are now accumulated at their generation sources. It is very likely that due to insufficient control part of them goes into municipal dumping sites or what is still worse directly into the environment. It is therefore evident that hazardous wastes management regulation by law providing for the reduction of their generation, for control and precise registering, for collection, rendering harmless and dumping system is a priority objective.

The hazardous wastes management system worked out in 1992 must be revised and improved to meet the current conditions and possibilities in Lithuania. Hazardous wastes collection, storage and management in regional sites should be started immediately.

Domestic and other non-hazardous wastes management. Domestic and other non-hazardous wastes were traditionally dumped into unfit municipal dumping sites, the system of waste management and health standards was incomplete, therefore, low-cultured attitude with regard to waste disposal prevailed. It is irresponsible to leave the problems related to domestic and other non-hazardous wastes management to municipalities alone, because support from the state is necessary in order their amounts are reduced (particularly the fast-growing volumes of disposable packaging), wastes separated, secondary raw materials recycled, dumping sites properly selected and constructed. In EU countries the amount of domestic wastes per capita is much higher than in Lithuania, therefore, it is necessary to take measures in order the already existing problem does not become worse.

Protection from physical pollution. Radioactive pollution from Ignalina Nuclear Power Plant and its thermal impact upon The Druksiu Lake together with other threats pose danger of an ecological imbalance. Potential exposure to radiation is also a threat to the inhabitants' safety. Therefore, Radiation Protection Law and other related legal documents should be drafted for the regulation of radiation safety standards, Ignalina Nuclear Power Plant environs radiation control, radioactive emissions standards, radioactive pollution fees, radioactive and nuclear substances import, transportation, acquisition, use and storage, radioactive wastes management, etc.

It is important to ensure public access to information on radioactive pollution and threats to the population so that in emergency situations at Ignalina NPP the population is trained to take safety actions.

In case a decision is taken to shut down the nuclear reactors, a programme for this purpose should be elaborated containing safety measures during the closing-down period.

To reduce noise levels in cities it is primarily necessary to map noise levels and noise spreading. Afterwards, to develop programmes for noise level reduction.

Land use and forest structure optimisation. An exclusive strategic objective is the formation of a rational, environmentally friendly land use structure to safeguard landscape stability. General land use structure optimisation can be achieved by:

- preservation and formation of the country's nature frame,

- optimisation of land use structure according to lithomorphological surface characteristics,
- increase of the area of ecosystems which regulate the natural balance,
- increase of aforestation, primarily in the most important zones of the nature frame,
- prevention of further urban development invasion into ecologically sensitive and most natural (picturesque) areas,
- preservation of most fertile lands.

Optimisation of land use structure requires an increase in the area of natural and semi-natural territories, first of all forests. A very important task in the formation of the land use structure is the development of an optimal territorial planning documents' system.

Prevention of further natural landscape degradation. To prevent further natural landscapes degradation, first of all in protected areas, it is necessary to:

- improve the inspection and management of protected areas,
- control the construction process through construction laws enforcement,
- reduce forest felling,
- develop a research-based system for the protected areas recreational use,
- promote ecologically sustainable farming,
- introduce more stringent control over the protection and use of protected areas,
- work out an incentive measures system to promote compliance with the protection and use regime.

It is an urgently necessary to establish administrations of regional parks, develop laws for the regulation of designing and construction activities, work out a privilege granting system to people living in protected areas and find financial resources to render such support.

Before the year 2000, planning schemes for all regional parks should be developed as well as management plans for strict nature reserves. Also, management plans for managed reserves and protected landscape objects should be developed. It is proposed that in 1997 preparation of business plans for national and regional parks is started. In nearest future a system of cognitive recreation must be developed.

Protection of ecologically sensitive and most natural (picturesque) areas. It is necessary to strengthen legal protection of the karst region in northern Lithuania, of ecologically sensitive territories and sea-coast recreational resources; to work out research-based methodology for the preservation and rehabilitation of coastal beaches. Dunes in the coastal beaches which are under a load of intensive recreation must be regularly reinforced. Special publications for land owners to enhance their environmental awareness as well as representational publications on Lithuania's recreational resources and their application potential must be issued. It is highly important to develop a system for granting subsidies, compensations and privileges to people living within or close to recreational districts to encourage their interest in the use of privately owned territories in line with recreational priorities; to develop infrastructure.

Rehabilitation of worked out mineral resources quarries. **M**ineral resources quarries which today have no owner pose quite a number of problems. For some there are no rehabilitation projects. Therefore, a significant part of the actions are is aimed at the rehabilitation of those districts which were damaged by mineral resources quarries, i. e. at finalising damaged areas inventory, working out of techniques and programmes for quarries rehabilitation as well as detailed rehabilitation projects and their implementation. It must be ensured that all worked out quarries are rehabilitated.

Not only the speeding up of rehabilitation process is important: it is equally important to prevent further expansion of injured areas. It is proposed to develop optimisation models for non-ferrous mineral resources mining and use per separate regions. With a view to reduce a negative impact upon the environment whilst mining for new kinds of mineral resources, research will be carried out. An integrated environmental impact assessment must be performed before starting iron ore mining, also, an assessment of mineral resources deposits' drainage impact upon water resources; ground water monitoring in limestone and dolomite quarries; and an assessment of geological potential of territories with on-going economic activities, etc. An economic, technical and environmental assessment of worked out anhydrite cavities is important before they are used to store various materials, including hazardous ones.

Rational use of natural resources. Importantly the use of natural resources should be well balanced. Priority actions: elaboration and implementation of imitation models of most severely affected used animal species, protection of

rare and endangered fish species' spawning grounds and introduction of valuable fish species in inland waters, improvement of fisheries techniques and gear, inventory of living nature resources, etc.

To protect fresh water resources from over-use it is necessary to install water meters at water in-take sites and implement measures for a rational use of water to prevent water resources' exhaustion. At municipal level, programmes aimed at water resources saving and reduction of losses as well as at their rational use; at preventing their exhaustion (and contamination) should be developed and implemented.

4.2. Environmental protection and economic activities

Among primary goals for sustainable economic development is the creation of a legal/economic system to avoid conflict between the qualitative economic growth and anthropogenic loads upon the environment. Actions should be organised so that environmental pollution and damage recovery costs are the responsibility of those benefiting from the activities or those who are users of natural resources or products. Priority environmental protection measures in economic activities are preventive ones providing for sustainable economic development. Programmes for most of national economy sectors have been developed, among them, National Energy Saving, Transport, Environmental Protection Programme and other programmes which also include environmental protection measures. Below are main tasks to be implemented for the country's sustainable economic development to preserve clean and healthy natural environment, biological and landscape diversity; and optimal nature use.

Energy sector. Promotion of energy saving, use of self-recovering energy resources, reduction of pollution from electric and thermal power plants through combustion processes' improvement and change for cleaner fuels, also, promotion of other specific pollution prevention measures outlined in the National Energy Strategy approved by the LRG 1994 as well as in the National Programme for the Improvement of Energy Consumption Effectiveness approved by the LRG 1992. New power plants should be constructed only based upon a thorough study of the demand, capacities, types of fuel and its supply as well as ecological acceptability, reliability and safety. To ensure ecological safety throughout the remaining operation period of the RBMK-type reactors at Ignalina NPP.

***Industry*.** Promotion of low-waste and cleaner technologies, saving of natural and energy resources and environmentally friendly production. Promotion of the production and use of multiple-use packaging and materials, the use of secondary raw materials and waste management, particularly hazardous wastes management, production of environmental technology.

***Agriculture*.** Improvement of land use, soil fertility preservation. Combination of intensive and extensive agriculture, promotion of environmentally clean agricultural production, introduction of sustainable and bio-organic agriculture, primarily in the karst region. Revision of acceptability of the further use of some agricultural objects located in environmentally sensitive areas. To ensure safe use of plant protection measures, fertilisers and other chemicals.

***Forestry*.** To ensure a rational use of timber. Aiming at wood products export, to gradually refuse raw materials export. Promotion of wider application of fire-wood - local self-recovering biological fuel. To increase the total country's forest area by green-planting in territories not suitable for agriculture, primarily in those with damaged agricultural landscape and nature frame territories.

***Transport*.** Gradual change to fuels meeting the EU standards, development of an independent fuel quality control system, implementation of exhaust gases neutralising systems, phasing out of ethylated gasoline, promotion of alternative fuel use, development of public transport, rationalisation of road and street systems with simultaneous implementation of environmental measures, introduction of rational traffic and its control systems and other measures delineated in the public programme "Transport and Environmental Protection".

Municipal sector. Immediate elaboration of a new municipal sector model based on the 'polluter/user pays' principle, on competition, economic incentives and interest of municipal and other industries in environmental awareness. First necessity is to:

- improve control over the green plantations in streets and public use areas in cities and towns;
- ensure domestic wastes registering, collection, sorting and recycling;
- improve dumping sites designing, installation and operation.

5. ENVIRONMENTAL POLICIES PRINCIPLES

The success of environmental policies implementation depends upon principles underlying the formation of action programmes and the achievement of environmental protection goals. Here are the basic environmental protection policies principles.

Sustainable development. This principle requires to direct the country's economic and social development so that meeting current demands does not reduce possibilities for future generations to meet their demands. The Declaration which consolidates this principle at world level was signed 1992 in Rio de Janeiro by Lithuania together with other countries of the world.

Consistent development. This principle maintains that goals can be achieved only by consistent development without omitting any of its stages. Lithuania's economy sectors are of unequal development stages, therefore, these differences have to be taken into account with a view to achieving sustainable development.

Environmental policy integration. This principle is closely linked with the implementation of the sustainable development principle. Environmental policy should be an integral part of all national economy and territories' development strategies. Aiming at sustainable and consistent development environmental protection measures must become an integral part of the whole process, they cannot be separated.

Precautionary principle. Often it is impossible to forecast human activities' impact upon the environment. To protect the environment, a state must to the extent possible follow the precautionary principle. In case of a threat of irrecoverable damage, all even most costly measures for the prevention of environmental damage are justifiable. Precautionary principle application must be based on forecasting, consistency and caution in prospecting consequences.

Polluter/User pays principle. This principle means that every responsibility including the material one for pollution or for environmental damage whilst using natural resources falls on polluters/users, i. e. all social and economic losses due to pollution or use of resources must be covered by polluters/users. This principle must in nearest future be fully implemented in water supply and treatment sector.

Prevention. In almost all cases environmental damage recovery costs are higher than those for damage prevention. Sometimes damage cannot be recovered at

all. Therefore, prevention is a more rational action technique than attempts to solve a problem after it has occurred.

Use of best available technology not entailing excessive costs. This principle maintains that whenever possible even if the set limits are not exceeded environmentally advanced and most effective technologies which at the same time do not entail excessive costs are used.

Subsidiarity principle. The main point is democracy and partnership contacts' strengthening in the process of decision making. Only the problems which cannot be locally resolved should be addressed at a higher level. This principle is targeted at:

- assistance to local communities in their environmental matters;
- enhancing the value of programmes and action plans;
- promoting opportunities for the selection of actions and measures.

The principle recognises the diversity of environmental problems and opportunities in various regions and the necessity to take this into account in delineating environmental policies.

Partnership and sharing of responsibilities. Balanced society goal can be achieved only by joint activities and co-operation of all interested parties: governmental, international organisations, local authorities, non-governmental organisations, economy branches through their associations, companies, consumers, members of society, etc. Each one of the partners recognises own responsibility for the implementation of environmental goals and acts by means available. Partnership development through shared responsibility is the essential task which cannot be implemented without recognition of opinion diversity and respect of different interests and well-founded opinions.

Information availability. The principle is aimed at developing a mechanism for public participation in the decision-making process, at involving people in the formation of environmental protection policies. Environmental information availability would encourage public interest and promote its activity for the implementation of environmental protection goals.

Assessment of sustainable development. Before sustainability criteria are adopted and applied it will not possible to precisely delineate any long-term objectives and goals, adapt actions to ever-changing conditions. Criteria and indications should be set to show environmental protection progress and the level of development sustainability.

6. STRATEGY IMPLEMENTATION INSTRUMENTS

6.1. Legal/Administrational Regulation

Legal environmental regulation. Highest priority should be accorded to an immediate review of environmental protection laws. Analysis and assessment of existing environmental laws and regulations including their positive aspects and gaps are necessary for a more specific definition of principles and goals underlying the environmental legislative code, for establishing priorities in the new legislation development or review of existing laws. All this has to be carried out in line with the EU environmental requirements. It is absolutely necessary that every activity be it of a negative impact upon the environment or aimed at its preservation is legally regulated.

According to the CE recommendations, basic environmental protection requirements for different sectors as well as environmental protection policies' enforcement measures should be incorporated into the Environmental Protection Law. It is not possible to develop and adopt all needed legal acts at a time. Also, it is necessary to take into consideration the EU environmental standards as Lithuania is undergoing an integration to the EU process. Therefore, The Environmental Protection Law should be followed by new subsidiary legislation.

When drafting new requirements it is necessary to consider the level of a legal act underlying the enforcement. It should be aimed at the lowest possible (sufficient) decision-making level. Wherever a Ministerial Order is sufficient, no Governmental decrees, laws, etc. should be drafted. This way legal documents issued would be more specific, less declarative, requiring fewer subsidiary legal acts.

When drafting new laws and other legal acts more attention should be given to their enforcement mechanisms, i. e. when setting new requirements their enforcement and control workability as well as enforcement period should be considered. Requirements adopted should be changed as infrequently as possible and be aimed at long-term objectives.

The following priority actions for the development of environmental legislation are proposed:

- analysis of the effectiveness of existing environmental laws and regulations with reference to the EU requirements and development of recommendations concerning new laws or the necessity to revise the existing ones;

- review of enforcement measures' efficiency and filling of gaps;
- draft legislation on: liability for past environmental damage, environmental status assessment during privatisation or transfer of ownership, environmental management; and environmental auditing;
- juridical environmental education for both experts and general public.

Enforcement. The following actions are proposed for the improvement of enforcement efficiency:

- strengthening of subdivisions responsible for enforcement, paying more attention to their preventive function;
- improvement of permitting procedure for better co-ordination of relations between institutions performing economic activities and enforcement institutions;
- improvement of technical basis, particularly by supplying laboratories of regional departments with better analytical equipment;
- improvement of enforcement officials' education and training; and preparation of aid literature;
- more publications for general public informing of environmental protection requirements.

Environmental quality is envisaged to be regulated by the following requirements (based on two-type methodological principles):

- pollution emission norms which are set following best environmental practices and best available technologies with an assessment of technical and economic possibilities;
- environmental quality standards - highest permissible ambient concentrations - established on the basis of impacts upon human health and environment.

Standards for basic physical and hydrochemical values, for nutrients and metal content in surface and sea water, for hazardous pollutants (metals, organic compounds and their halogenic derivatives) content in water bodies' bottom sediments must be reviewed in nearest future. Currently, Helsinki Commission recommendations for technological processes of paper, chemical, leather, textile, oil refining, food, metal finishing industries are being considered.

In 1996-1997 standards for basic and specific admixtures' concentrations in atmospheric air as well as pollutants emission norms for specific industries are planned to be developed as are emission norms for incineration plants, heat, energy production and transport. Criteria for the assessment of soil contamination with hazardous substances (oil, CHCs and metals) and clean-up recommendations must be set. Norms for radioactive substances in Ignalina NPP emissions, discharges, waste water sludge as well as environmental quality standards in the NPP impact zone are to be worked out and enacted. Norms for the use of natural resources have to be set. The development of norms for the use of mineral resources must be revised.

The National Environmental Quality Standardisation Programme envisages a review of the basic standards for analytical determination of environmental objects' quality and their harmonisation with the EU, international standardisation organisations (DIN, etc.) analytical standards.

Voluntary principle should be given more attention to. It is of particular importance for eco-labelling and for environmentally friendly operation of companies. In this field Lithuania is going to adopt standards to meet the EU requirements.

Environmental impact assessment. It is a major preventive measure to avoid irrevocable environmental changes. Environmental impact assessment must ensure that the potential impact of economic development is assessed and considered before economic activities are started. Environmental impact assessment procedures allow to forecast economic activities' impacts upon environment and elaborate measures to avoid or soften negative impacts, and select best economic development options.

Law on Environmental Impact Assessment and subsidiary legislation to follow will consolidate principles for environmental impact assessment with regard to the country's situation and international requirements contained in the EU directives and the Convention on Environmental Impact Assessment in a Transboundary Context. The new environmental impact assessment procedure should ensure active public participation in the decision-making process and access to information.

6.2. Territorial Planning

Territorial planning plays a key role not only in the country's overall management, but also in the implementation of State and regional environmental policies. Planning is a prerequisite for a sustainable development of the country's

territory, for the formation of a healthy and harmonised human living, working and recreational environment, for a rational use of natural resources, preservation of nature and culture landscape values, general ecological stability of the environment, for the formation of settlements' system development policies in line with environmental protection goals, for differentiation of the country's management with respect to varying natural conditions, etc. Territorial planning involves the determination of the main functions of territories, priorities for use and development trends, nature use and environmental regime, land, water, forest and settlements' management as well as location of infrastructure objects co-ordinating the needs of all spheres of economic activities with environmental protection interests.

To switch over to adverse effects prevention policies in environmental protection for the preservation of natural resources and landscape it is highly important to develop environmentally oriented territorial planning with consideration of environmental requirements, inclusion of an environmental part in the general and detailed territorial planning documents.

For the implementation of both state and regional environmental protection policies all general, special and detailed territory plans are important. Among specific environmental protection plans primarily are planning schemes for protected areas,
nature frame, natural resources' use and protection, etc. as well as regional environmental programmes. Environmental protection measures highlighted in the general plans are then developed in special plans covering forestry, land use, water sector, recreational use, urban development, infrastructural objects' location and development; and certainly in environmental protection plans which are vital in shaping and regulating farming land and infrastructure development strategies as well as in management programmes.

6.3. Economic Instruments

In attaining environmental strategy goals economic instruments are necessary to encourage pollution minimisation and prevention, waste minimisation and preservation of natural resources. Economic instruments encompass taxes on state natural resources; pollution charges; user charges; tax waivers; tax differentiation; subsidies, loans and funds. Here are a number of arguments in favour of economic instruments:

- they are consistent with the polluter/user pays principle;

- unlike administrational instruments (for producers, users and polluters a penalty should be less cost effective than investing in cleaner production), they are more flexible;
- they are dynamic and promote continuous improvement;
- they are more democratic because the right for decision making (as to how, what and when to change) remains with natural resources' users and polluters.

In the development and improvement of economic instruments system the following criteria should be met:

- effectiveness: the instrument should be directed at pollution reduction at source;
- easiness: instruments should be easy to implement and administer, their implementation costs and benefits should be well balanced;
- acceptability: instruments are more likely to be effective if they are acceptable to the society and if they can be incorporated into the existing market and institutional system;
- transparency: instruments should provide a clear signal to the market;
- economic efficiency: the instruments should provide a continuous incentive for seeking least-cost solutions;
- equity considerations: the instruments should not confer a disproportionate burden on the poorest members of society and those who are indirect users of nature resources causing no environmental pollution.

Taxes on the use of natural resources. The instrument has been in effect since 1992. Of late, the use of natural resources has declined to levels below permissible limits. With an increase in the use of some resources, such as peat and partly biota resources, more attention should be given to the incentive aspect of charges to limit the use of resources and promote their processing. New principles for taxation should be developed for the regulation of biota resources.

Pollution Charges and Penalties. The charge system is being revised with the aim of increasing its effectiveness. It is being recommended to introduce changes in the list of regulated pollutants by decreasing their number and grouping them into toxicity categories, focusing on the major ones - SO_2, NO_X, particulates in air, BOD, suspended solids, nitrogen, phosphorus in water, etc. Charge rates should be modified to better reflect the environmental protection objectives.

User Charges. It is being recommended also to revise user charges for water supply, wastewater treatment, municipal and industrial waste collection and disposal to achieve full cost recovery, to provide incentives for a rational use of water and other resources; and for a reduction of discharges and waste.

Product Charges. This type of charge has not yet received full attention in Lithuania. Application possibilities should be analysed in nearest future to provide incentives for a reduced use of packaging materials and their collection, for multiple use of packaging; and the use of higher quality fuel, etc.

6.4. Financial Instruments

Implementation of environmental protection measures contained in the Action Programme will be very much dependent upon availability of financial resources. State budget, loans and aid from foreign countries and international donors, environmental tariffs and other sources vary from one year to another, therefore, Action Programme funding will be discussed and approved of separately.

Investments into environmental protection. The majority of environmental investments are allocated from State Budget, another sources are loans and subsidies from foreign countries and international donor organisations, municipal funds and companies' own resources. Today the major part of environmental investments are directed for the construction of waste water treatment plants. Investments have been envisaged in the Public Investment Programme. The current system of granting subsidies to municipal institutions does not encourage environmental projects' implementation, therefore, it is necessary to develop a more effective mechanism for granting funds as well as for project implementation control.

Funding from user charges. Efforts should be made to change the currently existing system when all tax payers via State Budget cover costs of users/polluters to a system when users/polluters directly cover the losses incurred by their activities' impact upon the environment. It would be consistent with the polluter pays principle. For this, user tariffs formation policy has to be revised. A major change should be switching over to an environmental projects crediting system.

Environmental investment fund. To provide incentive for waste and pollution minimisation and to accumulate additional funds, it is expedient to establish an environmental investment fund. It is aimed at providing additional funds to cover economically feasible costs for resource saving or industrial pollution minimisation projects. After project implementation, revenues would be used to repay loans to the environmental investment fund thus revolving and increasing it.

6.5. Environmental Monitoring, Research and Information Management

Environmental monitoring. Environmental monitoring system should be improved with the help of the following measures which need urgent implementation:

- Law on Environmental Monitoring to be passed and regulations adopted;
- revision of State Environmental Monitoring Programme and its methodology based on internationally accepted criteria, making comparison with other countries' data;
- elaboration of internationally based (ISO 14 000) quality observation, sampling, analytical work and data processing standards;
- new equipment for field observations, sampling and laboratories, data processing technologies and software;
- revision of environmental monitoring stations location, assessment of equipment state; elaboration of criteria for the location of environmental monitoring stations; preparation of plans for equipment replacement and network improvement;
- improvements in co-ordination between the MEP structural units and other institutions responsible for state environmental monitoring, particularly in data transmission and processing;
- elaboration of special monitoring programmes for protected territories (state nature reserves, national and regional parks, strict managed nature reserves, etc.).

Environmental research. Recommendations for environmental research improvement:

- preparation of a State Environmental Research Programme to provide funds for principal environmental research efforts;
- compilation of environmental research and demonstration projects' register with annual reporting on project implementation and their benefits to environment;

- examination of environmental research carried out by state-funded universities and research institutions to identify areas not covered by existing programmes and those which partly overlap;
- awarding of state funds to universities and research institutions for environmental research on the basis of open competitive tendering and submission of project proposals;
- opportunities for Lithuanian researchers to participate in international projects.

Data and information management. Environmental Information Systems Strategy is currently being developed and should be completed soon for appropriate use of the latest achievements in information management and technologies (hardware and software systems and telecommunications).
Priority actions in information management:

- further develop Nature Objects' State Cadastres and Registers as well as the existing electronic data transfer system for industries' environmental statistical information processing and integration into geographical information and other environmental information systems;
- agree on a common data base format for the acquisition, verification, storage and transmission of environmental monitoring, natural resources use, landscape protection and other relevant information;
- develop a system for environmental quality and natural resources information exchange between the Presidential Office, Seimas, Government, ministries and other state institutions and municipalities
- provide access to information for general public and NGOs, implement "freedom of environmental information" policy based on public information laws harmonised with the EU requirements;
- link the MEP and other national institutions involved in environmental activities, such as universities and research organisations, in a network allowing electronic mail, bulletin board, file exchange and access to Internet;
- establish a centre for the receipt and processing of satellite information; for the production of digital maps based on continuous and operational satellite information.

6.6. Public Awareness and Environmental Education

Public participation in environmental matters is one of the key factors for a successful Lithuanian Environmental Strategy implementation. For this, it is necessary that:

- society has the knowledge, expertise and skills to achieve sustainable development;
- there is public awareness of environmental concerns and interest in finding solutions;
- active public participation in environmental policies formation and actions is encouraged;
- non-governmental environmental organisations are supported, information dissemination via mass media is improved, environmentally clean production and consumption, energy saving and raw materials saving are promoted.

For public awareness and environmental education improvement it is envisaged to:

- develop public environmental awareness system based upon the draft UN ECE Convention on Environmental Information Dissemination and Public Participation;
- develop a system for environmental information dissemination to the general public;
- produce and implement ecological education training programmes for lecturers and teachers;
- introduce ecological education into curricula of all-level educational institutions;
- organise competitions for schools and students based on the accomplishment of environmental projects to high scientific and technical standards; as well as any additional ecological educational activities;
- prepare and implement environmental training programmes for specialists working in industries end environmental objects, etc.;
- prepare and issue publications illustrating the importance of environmental quality, natural resources protection, landscape and biodiversity conservation, and practical actions.

Approved by
the Lithuanian Republic Government
Decree No 938
5 August 1996

7. ACTION PROGRAMME

7.1. Environmental Quality Action Programme

Actions	Timescale	Responsible organisations
Reduction of contamination with municipal, industrial and surface (storm) waste water		
* Develop subsidiary legislation after the Law on Water is passed by the Seimas	1996-1997	MEP
* Review the system of pollution charges and prepare amendments	1996-1997	MEP, FM
* Develop methodology for water supply, waste water collection and treatment tariffs including needed investments and operation costs	1996	MCUD, MEP
* Develop order for the assessment of treatment facility technologies, equipment, design and testing	1996-1997	MEP, MCUD
* Develop standards and concept for designing surface (storm) waste water collection and treatment equipment	1996-1997	MCUD, MEP
* Continue the on-going and construct new waste water treatment facilities in cities and district centres	1996-2000	MEP, M
* Develop and implement municipal level programmes for the construction and reconstruction of primary waste water treatment plants in industries	1996-2000	MEP, M, CI, MPARLA
* Assess and improve small waste water treatment plant projects in rural areas, optimise their operation and establish local operational services	1997	MEP, MA, RA, MCUD
* Develop waste water treatment technologies for individual houses and their groups, prepare their implementation scheme	1998-2000	MEP, MCUD,
* Introduce and develop the production of waste water treatment technologies in Lithuania	1996-2000	MIT, MEP, EEA

Actions	Timescale	Responsible organisations
* Assess the efficiency of filtration fields and prepare recommendations for their application.	1997	MEP, MH
* Develop waste water treatment facilities' personnel training and certification programmes	1996	MEP, M
Reduction of the Baltic Sea pollution and contaminated water influx from other countries		
* Prepare Draft Governmental Decree to improve the system of combating accidents in the sea and sea-water pollution control	1997	MEP, ME, MT
* Work out Sea Water Protection Programme for the transportation of orimulsion and oil products	1997-1998	KSPA, MEP, MT
* Conclude bilateral or multilateral inter-state agreements for the use and protection of transboundary water bodies	1996-2000	MEP, MFA, MT
Reduction of ground water contamination, improvement of drinking water quality		
* Develop drinking water standard	1996-1997	MH, LGS (MCUD)
* Establish water in-take sites 2 and 3 sanitary zones (lines) in cities according to the Ministry of Health requirements	1996-2000	M, MEP,LGS (MCUD)
* Construct drinking water preparation facilities in central water in-take sites (Klaipeda, Siauliai, Joniskis, Kedainiai, Vilnius, etc.)	since 1996	M
Reduction of water contamination from agricultural and other non-point pollution sources		
* Develop a legal document (norm) to limit the number of livestock per area unit	1996-1998	MA, MEP
* Develop and implement plans for the utilisation of major livestock companies' waste water	1996-1997	MA
* Perform an integrated non-point source agricultural pollution assessment and develop forecasting methodology	1997-1998	MEP, MA LGS(MCUD)
* Develop a waste minimisation programme for the karst region in northern Lithuania	1997-1998	MEP, MA, M
* Prepare and publish information on demonstration farm projects with optimal solutions to address problems of agricultural waste water utilisation and non-point source pollution	1999	MA, MEP

Actions	Timescale	Responsible organisations
Reduction of air pollution from transport		
* Apply economic instruments to promote the production and use of high quality clean fuels	1996-1997	MEP, MT, M
* Develop national requirements for vehicles in line with the EU Directives	1996	MT
* Develop and implement an integrated programme for fuels in line with the EU requirements	1997-1998	MEP,SQI,MT ME, DS
* Advocate the use of clean fuels	1996-2000	MEP
* Develop measures to promote the use of alternative fuel for transport	1997-1998	MEP,ME, MT
* Implement economic and organisational measures to limit traffic in cities	1997-1998	M, MEP, MIA
Reduction of NO_x, SO_2, CO_2, VOC emissions from point sources		
* Draft Law on Atmosphere Protection	1997	MEP
* Review the system of pollution charges and prepare changes to it	1996-1997	MEP
* Perform environmental impact assessment for the use of orimulsion and develop recommendations for its further use	1997	ME, MEP,MH
* Upgrade and implement new boiler burners to reduce NO_x emissions	1996-2000	ME
* In industries, gradually introduce best available technologies not entailing excessive costs	continuous	ME, MIT
* Introduce automated air quality monitoring systems in Lithuanian cities, and systems to monitor pollutants emissions from energy and industrial objects	1996-2000	M,MEP, ME,MIT
* Design, produce and implement technologies to render harmless volatile organic compounds as well as treatment facilities; and control its use	continuous	MIT, MEP
Reduction of ozone depleting substances emissions		
* Develop normative documents for the regulation of import, export and use of ozone depleting substances	1996-1997	MEP, MIT

Actions	Timescale	Responsible organisations
* Develop normative documents for the regulation of the consumption and marketing of goods produced with the use of ozone depleting substances	1996-1997	MEP, MIT
Reduction of air pollution with suspended solids		
* Assess the status of dust filters in industries and prepare a strategy for their upgrading and implementation	1996-1998	MEP, MIT
* Organise production, construction and reconstruction of dust trapping equipment, optimise and improve technological processes	1998-2000	MEP
Reduction of soil contamination with organic and mineral fertilisers and other agricultural chemicals		
* Draft Soil Protection Law	1997	MEP, MA, MH
* Develop soil quality and monitoring standards and norms	1996-1999	MEP, LGS(MCUD)
* Prepare a study on the demand for new environmentally friendly soil fertilising and plant protection means in agriculture	1997-1998	MA, MEP
Reduction of soil contamination with oil products		
* Draft Law on Liability for Past Environmental Damage	1997-1998	MEP, ME
* Compile an inventory of areas polluted with oil products, continue with studies on clean-up possibilities of these areas, including the former Soviet military sites, and develop clean-up and renaturalisation programmes	1997-2000	MEP, M, LGS(MCUD)
* Develop a plan to prevent Lithuanian railroads pollution with oil products	1996-1998	MT, MEP
Reduction of soil contamination in cities and industrial areas; reduction of soil pollution with heavy metals		
* Systematise data on soil contamination with heavy metals and publish information/ cartographic material on levels of contamination with heavy metals, on risk levels and prevention measures	1996-2000	MEP
* Create polluted soils data bases and monitoring plans per separate municipalities	1998-2000	MEP, M

Actions	Timescale	Responsible organisations
Domestic wastes management		
* Develop rules for domestic and other non-hazardous wastes management, dumping sites construction and operation	1996-1997	MCUD, MIT, M, MEP
* Assess the potential for secondary raw materials recycling, make market studies for products from secondary raw materials	1996-1997	MIT, MEP, M
* Increase efforts of sorting domestic wastes and secondary raw materials collection and application	1996-2000	MIT, MCUD, M
* Renaturalise closed down dumping sites	continuous	M, MEP, MH, MCUD
Industrial and hazardous wastes management		
* Sign and ratify the Basel Convention, develop rules for wastes import and export	1996-1997	MEP
* Take care of and render harmless prohibited and old pesticides	1996-1997	MEP
* Amend the Feasibility Study on Waste Management	1996-1997	MEP, MIT
* Develop and implement a programme for hospital waste management	1996-2000	MH, MIT, MEP
Radioactive contamination and radiation safety		
* Prepare recommendations for economic incentives to reduce radioactive contamination	1997-1998	MEP
* Draft Radiation Safety Law and subsidiary legislation	1996-2000	MH, MEP, LNPSI
* Perform an international environmental impact assessment of the radioactive wastes storage in Sirvintos District and assess its elimination possibilities	1996-1998	MEP
* Install disactivation stations at evacuation points around Ignalina NPP	1996-2000	LNPSI, DCS MEP
* Compile a balance of environmental radioactive contamination and assess its change trends	1996-2000	LNPSI, MEP
* Develop an integrated radioecological monitoring system	1996-2000	MEP, LNPSI
* Develop a system for the population to familiarise with radioactive contamination and the ionising radiation exposure impact upon human health	1996-2000	MH, MEP, LNPSI

Actions	Timescale	Responsible organisations
Noise reduction in cities		
* Map noise levels and develop noise minimisation programmes in cities	1997-1998	M, MH, RP, MCUD,MEP,
* Develop and implement a normative system for automobile noise levels for all types of automobiles according to the EU recommendations	1998-2000	MT, MH
Environmental Health Monitoring and Control		
* Develop an Environmental Health Action Plan	1996-1997	MH, MEP
* Create an information system "Environment and Health"	1996-2000	MH, MEP, MIC
* Develop and implement environmental education and training programmes	1997-2000	MEP, MES
* Study and monitor the impacts of environmental contamination upon human health	1996-2000	MH, MEP

7.2. Action Plan for the Preservation of Natural Resources, Landscape and Biodiversity

Actions	Time Scale	Responsible Organisations
Optimisation of the general land use structure		
* Develop and adopt rules for the development of all territorial special environmental management documents	1997-1998	MEP
* Develop methodology for the optimisation of land use structure	1997-1998	MA, MEP
* Develop general (land management) plans of the national, counties' and municipal levels with consideration of the nature frame structure	1996-2000	MCUD, RA,M
Prevention of the nature frame areas from degradation		
* Develop nature frame schemes at local level for agrarian and urban areas, S 1:10 000	1997-2000	M,MEP,MA
* Develop cartographic territorial network schemes of ecotopes (habitats) for biodiversity preservation within nature frame at national and regional territorial planning levels	1997-1998	MEP

Actions	Timescale	Responsible organisations
Prevention of soil layer structure from degradation		
* Develop methodology for agrarian farming lands classification into categories and for the implementation of anti-erosive agriculture system	1996-1998	MA
* Develop methodological recommendations to minimise water-caused soil erosion and depletion	1998	MEP, MF
* Develop schemes for agrarian farming lands classification into categories	1997-1999	MA
* Renaturalise areas under economic activities	1997-2000	MEP, M
* Develop soil data base	1998-2000	MEP, MA
Prevention of karst landscape degradation		
* Develop a planning scheme for the biosphere grounds of the karst region	1998-1999	MEP
* Implement the Karst Region Preservation Programme	continuous	MA,Fund "Tatula"
Prevention of wetland landscape from further degradation		
* Develop regulations for wetland protection	1997-1998	MEP
* Develop a programme for wetland protection and renaturalisation	1997-1999	MEP
* Perform an integrated environmental assessment of wetlands and compile an inventory of wetlands which are under protection according to the Ramsar Convention	1997-1998	MEP
Optimisation of protected areas network		
* Develop a network of biosphere monitoring and recuperative areas, develop boundary plans or management schemes	1997-2000	MEP, MF
* Set up protected areas in the former military sites valuable from natural point of view and establish Daugai Regional Park after its planning scheme preparation	1996-2000	MEP, MF
* Prepare methodological recommendations for construction projects in protected areas	1997	MEP, MCUD
* Develop a compensation and privilege granting system (supplementary legislation) for people living in protected areas	1997-1999	MEP, FM

Actions	Timescale	Responsible organisations
* Set up administrations for regional parks	1996-1997	MEP, MF, M, RA
* Develop planning schemes for regional parks and plans for strict nature reserves, landscape managed reserves and nature monuments	1997-2000	MEP, MF
* Start the development of business plans for national and regional parks	since 1997	MEP, MF, M, RA
* Carry out botanical/zoological research in managed reserves set up in 1992	1997-2000	MEP
* Compile a Protected Areas Cadastre	1996-1998	MEP
* Prepare and publish cognitive popular series Protected Areas System in Lithuanian Republic	1996-1999	MEP
Prevention of urban and smaller settlements natural landscape degradation		
* Develop methodological recommendations for natural landscape preservation and formation in urban areas	1997	MEP, MCUD
* Evaluate the environmental importance of natural or developed plantations	1997	MEP,MCUD, M
* Prepare and implement detailed projects for the green areas management	continuous	M
* Carry out geographic, architectural and botanical/zoological research of landscapes in cities and towns	1997-1998	M
* Develop regulations for the management, control and protection of public green plantations in cities and towns	1997	MCUD, MEP
Prevention of fungi, plant and animal species and communities from declining as well as ecosystems degradation		
* Accede to CITES and Bonn Conventions	1996-2000	MEP
* Draft Vegetation Law and subordinate legislation to both Wildlife Law and the Law on Protected Animal, Plant and Fungi Species and Communities	1996-1998	MEP
* Develop regulations for live nature objects and resources export and import	1997	MEP
* Develop and implement a national biodiversity preservation action strategy and a study on biodiversity	1996-2015	MEP

Actions	Timescale	Responsible organisations
* Prepare a new version of the Red Data Book of Lithuania and publish a Red Data Book on Lithuanian plant communities	1997-2000	MEP
Forest structure optimisation		
* Prepare a programme for withering spruce forests' rehabilitation	1996-1997	MF
* Compile an inventory on the sanitary state of forests	1996-2000	MF
Wildlife use optimisation		
* Develop supplementary legislation to the Fisheries Law for the regulation of the use of other wildlife resources	1996-1997	MA, MEP
* Develop fauna registering methodology and compile a register of wildlife resources	1996-1997	MEP, MF
* Develop and implement species imitation models for the most valuable and most affected used animal species	1997-2000	MEP
* Carry out research on natural processes which have an impact upon fish reproduction and the preservation of fish, and their feeding grounds	1996-1997	MEP
* Assess the biological status of Lithuania's hunted fauna	1997-1998	MEP, MF
Prevention of river valleys and lake deeps as well as marine biocenoeses from further degradation		
* Proof-read the regulations on water bodies protection zones	1997	MEP
* Develop subsidiary legislation to the Sea Protection Law	1997	MEP
* Develop documents with the aim to ratify MARPOL 73/78 Convention and the UNO Maritime Law of 1992	1996-1997	MEP
* Develop norms for efficient plant/animal biotopes preservation in Lithuania's marine environment	1997-1999	MEP
* Develop and implement a National Baltic Sea Programme	1997-2000	MEP
Prevention of further degradation of the agrarian recreational environment		
* Develop Recreational Areas Regulations	1997	MCUD, SDT, MEP

Actions	Timescale	Responsible organisations
* Compile a national cadastre of recreational areas	1997	SDT, MCUD, M
Prevent further degradation of coastal beaches and dunes		
* Develop regulations for the preservation of coasts as well as rules for the recreational use of beaches and dunes	1997	MEP
* Develop Lithuanian coastal management programme	1997-1998	MEP, RA
* Develop and implement recreational infrastructure schemes (detailed projects) for recreational zones of Palanga and Klaipeda coastal beaches	1997-2000	Palanga and Klaipeda M
* Develop research-based methodology for the rehabilitation and preservation of coastal beaches	1997-1999	MEP
Prevention of further urbanisation of the most picturesque natural areas		
* Develop methodology to determine economic equivalents to the landscape aesthetic value and carry out an assessment of landscape aesthetics	1998-1999	SDT, MEP
Rational use of earth entrails resources, renaturalisation of areas damaged by quarries		
* Develop subordinate legislation to the Law on Earth Entrails	1996-1997	MEP, LGS(MCUD)
* Develop methodology for the renaturalisation of mineral resources quarries	1996	MEP
* Complete the inventory of damaged areas and develop a programme for the renaturalisation of areas damaged by mineral resources quarries	1996-1998	M, MEP, MA
Reduction of a negative impact upon the environment whilst exploiting oil drills and using geothermal energy		
* Develop a permitting system for the use of geothermal energy	1996	LGS(MCUD) MEP
* Develop rules for oil and gas surveys and the exploitation of deposists	1997	ME, MEP, LGS(MCUD)
Reduction of a negative impact upon the environment whilst exploiting other mineral resources		
* Develop methodology to forecast ecological impacts whilst exploiting mineral resources by drills and mining	1997-1998	LGS(MCUD) MEP

Actions	Timescale	Responsible organisations
* Develop optimisation models of non-ferrous mineral resources (peat and fresh-water lime) mining and use per separate regions	since 1997	MEP, MIT
* Assess the geological potential in the territory of Lithuania and develop geoecological maps, S 1: 200 000	1998-2000	LGS(MCUD) MEP
* Develop an action plan to promote anhydrite exploitation with a possibility to use the hollows as storages for various materials	1996-1999	MIT, LGS(MCUD) MEP
Protection of water resources from over-use whilst oprating water in-take sites		
* Develop rules to monitor the quantities of extracted and consumed water	1997	MEP, MCUD
* Set rules and methodological recommendations for the development of water resources preservation and use schemes	1997	MEP, LGS(MCUD)
* Develop and implement water saving programmes for municipalities	1997-2000	M, MEP, users
* Compile river, lake, pond and ground water cadastres	1997-2000	MEP, LGS(MCUD)
Prevention of structural changes in the natural hydrographic network		
* Develop regulations for the preservation of smaller rivers and rivulets and change those for coastal and protection zones near surface water bodies	1997-1998	MEP
* Develop a programme to optimise the territorial location of ponds	1996-2000	MEP

GENERAL CONCLUSIONS

The Lithuanian Environmental Strategy contains an environmental status assessment, it formulates environmental protection goals and objectives, priorities, action plans and forecasts future results. Many factors will influence the implementation of the set goals and measures. It is necessary to realise that it is only the first step in a long process. In order the Lithuanian Environmental Strategy does not remain a mere document it should be turned into a continuously renewing process; lessons should be drawn from past mistakes and new ways to achieve the objectives should be selected. Effective Lithuanian Environmental Strategy Action Programme implementation requires good co-ordination and feedback between all involved state, municipal and non-governmental organisations in developing and implementing their action plans. After the basic measures outlined in the Strategy are realised, further actions could be specified or supplemented.

For the LES Action Programme implementation it is necessary to:

- prepare annual Action Plans for the LES implementation;
- provide financial calculations for funds needed for the implementation of envisaged measures;
- safeguard timely implementation of envisaged measures;
- select Programme Implementation partners according to established procedures;
- control the implementation of the LES Action Programme and use of funds.

To facilitate and speed up the implementation of strategic actions it is proposed to establish a Lithuanian Environmental Strategy Implementation Co-ordination Group under the MEP for the co-ordination of the Action Programme implementation and control. Based upon the Co-ordination Group reports, the LES would be regularly revised and adapted to the ever changing environmental, economic and social conditions. The Action Programme should be annually revised based upon:

- latest plans for Lithuania's national economy development;
- changes in the laws;
- environmental information;
- the EU requirements and those arising from agreements with other international organisations;
- funds allocated for environmental protection;
- environmental needs of the society.

ACCRONYMS AND ABBREVIATIONS

BOD	Biochemical Oxygen Demand
CE	Council of Europe
CHCs	Chlorinated Hydrocarbons
CI	Confederation of Industrialists
DCS	Department of Civil Safety
DIN	Deutsche Industrie Norm
DS	Department of Standardisation
EU	European Union
FM	Ministry of Finance
HAS	Hydro Accumulation Station
HPP	Hydro Power Plant
ISOInt	International Standards Organisation
LES	Lithuanian Environmental Strategy
LGS	Lithuanian Geological Service
LNPSI	Lithuanian Nuclear Power Safety Inspectorate
LRG	Lithuanian Republic Government
M	Municipalities
MA	Ministry of Agriculture
MAC	Maximum Allowable Concentrations
MCUD	Ministry of Construction and Urban Development
ME	Ministry of Energetics
MEd	Municipal Economy Department
MEP	Ministry of Environmental Protection
MES	Ministry of Education and Science
MF	Ministry of Forestry
MH	Ministry of Health
MIA	Ministry of Internal Affairs
MIC	Ministry of Informatics and Communications
MIT	Ministry of Industry and Trade
MPARLA	Ministry of Public Administration Reforms and Local Authorities
MPD	Maximum Permissible Discharge
MSD	Municipal Services Department
MT	Ministry of Transport
NEPS	National Environmental Protection Strategy
NPP	Nuclear Power Plant
RA	Regional Administration
RP	Road Police
SDP	State Department of Tourism
SQI	State Quality Inspectorate

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