

Biodiversity and Companies
Review of activities in Lithuania

Compiled by Anna Budriene

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Summary

In Lithuania, there have been adopted 36 laws, which directly or indirectly regulate environmental protection and the usage of natural biological resources including those concerning the environmental impact assessment (EIA). However, assessment of impact on biodiversity is directly declared in very few legal acts. The significant legal problems are an inadequate coordination of laws, their ineffective implementation and insufficient public participation in considering proposals for legislation.

The environmental protection principles are presented in the National Environmental Protection Strategy. The Ministry of Environment is the major institution implementing the environmental law. The impact of other state policies on environmental regulation is less obvious. The most important regulations include tax rates, fees and compensation payments.

The Environmental Projects Management Agency (EPMA) under the Ministry of Environment finances private and public sector implementing water, hazardous waste management, waste recycling, renewable energy and energy efficiency projects via subsidies and soft loans. Also, EPMA manages the environment protection projects funded from the EU Cohesion Fund and Structural funds and the Instrument for Structural Policies for Pre-Accession (ISPA). Being the only Lithuanian institution, responsible for the implementation of the National Agricultural Policy measures, the National Paying Agency under the Ministry of Agriculture manages the Rural Development Plan measures (“Agri-Environment”, “Afforestation of Agricultural Land”) and Single Programming Document measures (“Forestry Development” and “Water Resources Protection and Development”). At the end of 2007, the first payments under the Lithuanian Rural Development Programme for 2007-2013 were done, covering the “Agri-environmental payments” and “Natura 2000 payments and payments related to the Natura 2000 support in the areas of agricultural land.

At present, Lithuanian companies do not consider the accounting of the impact on biodiversity. However, some related activities, namely, the Environmental Management Accounting (EMA) and Environmental Impact Assessments (EIA) are implemented here. The EMA is still in development stage, while the EIA is relatively actively used. Leading companies are now active in the field of cleaner production (CP) and environmental management system (EMS). Despite positive results, CP, eco-design and other similar practices as well as voluntary eco-activity do still not considered by industry and other stakeholders as a primary option.

In Lithuania, the Business & Biodiversity initiative has not yet launched. However, some related activities are going on. One of them is the Corporate Social Responsibility concept (CSR). Responsibility for CSR as a public policy has been assigned to the Ministry of Social Security and Labour of Lithuania. The Ministry has approved the Plan on the means of CSR promotion in 2006-2008.

Activities, related to ecological engineering, are conducted mostly by public technical institutions. Of these, the Institute of Environmental Engineering of Kaunas University of Technology (APINI) is the main promoter of the three pillars of sustainable industrial development – economic viability, environmental protection and social responsibility. APINI participated in a series of different international projects on waste minimization, pollution prevention, cleaner production, environmental management systems (EMS), eco-design and eco-labelling, environmental impact assessment, integrated pollution prevention and control (IPPC) directive implementation, integrated water management and sustainable development. However, linking the R&D system with the country’s industrial structure via application of R&D results in traditional mid-low tech industries remains a conceptual and practical task for both, R&D and economy policies.

Introduction

Lately Lithuania was one of the fastest growing economies in Europe with the GDP growth of 9,7% in 2003, 6,3% in 2004, 7% in 2005 and 6% in 2006. The country has the biggest economy among the Baltic States, producing about half of their GDP (Lideika et al. 2005).

The National Strategy of Sustainable Development (adopted in 2003) encompasses six branches of economy (transport, industry, energy, agriculture, household, tourism), four environmental sectors (air, water, biodiversity and waste), four main social aspects (employment, poverty and health, education, cultural identity), and regional development issues (Klevas et al. 2007).

Although energy consumption and emissions have decreased significantly in the Baltic States, environmental concerns are affecting energy policy, as the energy sector is a major contributor to recent environmental problems. The Baltic States have committed to reduce their greenhouse gas emissions in order to limit the negative impacts on climate change. Under the Kyoto Protocol, Lithuania have taken on a target of minus 8% from 1990 levels by the period from 2008 to 2012. To reach this target, attention must be paid to technological changes that provide major environmental benefits (Miškinis et al. 2006).

In the light of the integration into the EU, the most negative impact on energy sector and all economy will be caused by the closure of Ignalina nuclear power plant in 2010 (Štreimikiene 2005). The National Energy Strategy of Lithuania calls for the reduction of fuel import and reduction of impacts of energy production on the atmosphere. The focus is on promoting the use of renewable energy and other local energy sources as well as on increasing the efficiency of energy usage in all sectors of the country (Ciegis and Štreimikiene 2004; 2006).

According to the EU legislation, until 2012, there should be closed all about 800 landfills operative at a moment, and there should be set up 11 modern regional landfills plus one for the hazardous waste. After 2012 landfilling of untreated hazardous waste will be banned (Ulinskaite et al. 2006).

Strict EU requirements in the field of minimization of environmental impact by industry will speed up the implementation of environment friendly technologies and cleaner production methods, as well as application of more effective environmental protection measures.

Irrespective of good economic results of recent years, future forecasts are less optimistic. In the long-term period the Lithuanian economy might be negatively affected by Lithuania's manufacturing oriented towards low and medium-high technologies, inability to create and implement innovations which is the driver of current economy. The National Lisbon Strategy Implementation Programme approved by the Republic of Lithuania Government Resolution No. 1270 of 22 November 2005 ("Valstybes žinios" (Official Gazette), 2005, No. 139-5019) recognises that "lack of activity of businesses in investing in Research, Development and Innovation (R&D&I) might have serious consequences for the long-term development of business in Lithuania and growth of its economy"(Integrated ...).

The goal of this review was to survey the Lithuanian legislative base that regulates the companies' activities having impact on biodiversity or contributing to biodiversity protection.

National regulations concerning impact on biodiversity and their implementation

Biodiversity impact assessments

There have been 36 laws adopted in Lithuania, which directly or indirectly regulate environmental protection and the usage of natural biological resources. However, assessment of

impact on biodiversity is directly declared in very few legal acts. Even if biodiversity protection needs are mentioned in the environmental policy documents, usually there are no suggestions on how they should be implemented in practice. In most cases, the documents merely declare that there is a need to mitigate the impact on biodiversity. Nevertheless, legal acts that are directly related to the biodiversity impact assessment are those on environmental impact assessment. A description of the main legal act statements, concerning the environmental impact assessment (EIA) is presented in Table 1 of Annex. These are: the Law on Environmental Protection; The Law on Forests; The Law on Animal Protection; The Law on Rare and Endangered Species; The Law on Water; The Law on Aquatic Environment; the Law on Environmental Impact Assessment (EIA) for Planned Economic Activities; the Law on Territorial Planning; the Law on Construction, etc. For example, according to Article 15 of the Law on Environmental Protection, legal and natural persons who plan to engage in economic activities must, at their own expense, prepare and submit to appropriate institutions the documents concerning possible impact of their economic activities on the environment, including the biodiversity. The EIA is performed in Lithuania since 1996 pursuant to the Law on the Environmental Impact Assessment of Planned Economic Activities (“Valstybes žinios”, No. 82-1965, 1996, No. 84-3105, 2005) regulating the EIA process and mutual relations of the participants. The assessment is obligatory for particular activities in:

- agriculture and aquaculture (pig rearing (900 or more sows; 3,000 or more other pigs); hen rearing (85,000 or more broilers; 60,000 or more hens); dams and other installations designed for the holding back or permanent storage of water (where the amount of water held back or stored exceeds 5 million cubic metres or where the area of water surface exceeds 250 ha);
- extractive and manufacturing industry (oil extraction or processing; extraction of natural gas (where daily extraction volume exceeds 500,000 cubic metres); peat extraction (where extraction surface area is 150 ha or larger); extraction of other mineral resources or stone crushing (where the mining surface area is 25 ha or larger);
- energy industry (thermal power stations and other combustion installations, including industrial installations for the generation of electricity or steam or the heating of water (with the output of 300 MW); installation of nuclear power stations and other nuclear reactors including the dismantling or decommissioning of such power stations or reactors; production, processing, enrichment, storage or disposal of nuclear fuel; gasification and liquefaction of coal or bituminous shale per day (where installations capacities is 500 tons per day or more);
- production and processing of metals (initial smelting of cast-iron and steel; production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes; mineral construction materials industry).
- chemical industry (industrial production of organic chemicals, inorganic chemicals, phosphorous-, nitrogen- or potassium-based fertilizers (including compound fertilizers), other plant health products (including biocides), and pharmaceutical products; installations for storage of petroleum, petrochemical, or chemical products (warehouses or sites) with a capacity of 200,000 tonnes or more; production of explosives);
- wood and paper industries (production of paper or board (where production capacity is 200 tonnes per day or more); production of pulp from timber);
- infrastructure proposed economic activities (construction of sea ports, piers or transshipment terminals (for ships with the carrying capacity of 1,350 tonnes or more); construction of inland waterways, harbours, piers or transshipment terminals (for ships with the carrying capacity of 1,350 tonnes or more); building of main roads and country roads; building of roads with four or more lanes or reconstruction of roads with more than four lanes, by installing four or more lanes (where a continuous road section of 10 km or longer is being built/reconstructed); construction of main public railway lines; construction of airports or aerodromes (with the runway length 2,100 m or longer); pipelines for the transport of gas, oil or chemicals with a diameter of more

than 800 mm and a length of more than 40 km; construction of overhead electrical power lines with a voltage of 110 kV or more and a length of more than 15 km);

– other proposed economic activities (installation of water abstraction facilities (with the annual volume of water abstracted equivalent to or exceeds 10 million cubic metres); artificial groundwater recharge schemes (with the annual volume of water recharged is equivalent to or exceeds 10 million cubic metres); transfer of water resources between river basins where the amount of water transferred exceeds 100 million cubic metres/year, or the transfer of water resources between river basins where the multi-annual average flow of the basin of abstraction exceeds 2000 million cubic metres/year and where the amount of water transferred exceeds 5 % of this flow; urban or rural waste water treatment plants with a capacity exceeding 50,000 or larger population equivalent; construction and decommissioning of installations for the processing, usage, storage and disposal of radioactive waste; construction or fitting out of structures/installations for the disposal or utilisation of hazardous waste; construction or fitting out of structures/installations for the disposal or utilisation of non-hazardous waste by incineration or chemical processing (where capacity of installations is 100 tonnes per day or more).

A significant part of the legal system for environmental protection is composed of decisions made by the government. Nevertheless, the documentation of government-regulated environment protection is regularly amended. The most significant legal problems to emerge are an inadequate coordination of laws, their ineffective implementation and insufficient public participation in considering proposals for legislation (Mierauskas 2004).

Mitigation/compensation for biodiversity impact

The formation of environmental programmes and the achievement of environmental goals are based on a number of environmental protection principles laid down in the National Environmental Protection Strategy, among them, the principle of sustainable development, environmental policy integration principle, precautionary principle, “polluter pays” principle, use of best available technology principle, partnership and sharing of responsibilities, information availability, assessment of sustainable development, etc. These principles are followed by the environmental authorities in the course of formation and implementation of environmental law. The impact of other state policies on environmental regulation is not clear so far and particular regulatory controls influencing environmental regulation could hardly be identified. Price controls and energy regulation do not effect the enforcement regulation to a great extent and could be recognised merely as complementary rather than regulatory controls.

There are several laws pertaining to nature protection in Lithuania (Annex: Table 1). The most important are those related to the “Law on Protected Areas”. The “Law on Protected Areas” establishes a system of protected areas and sets objectives and status of each protected area. The strictest of those is the “Criminal Code”, which is used very rarely, but includes the possibility even to put a person into a jail for trespassing into a protected area. The “Administrative Code” is applied more often; penalties include fines and compensation payments for harm to nature.

All funds collected from fines and compensations go to the Environment Protection Fund account, which is controlled by the Ministry of Environment Protection. 40% of funds from this fund are used to compensate damage done to nature, 30% goes to remuneration of employees (inspectors) and the rest are used for education, social activities and other purposes. The other main sectoral environmental laws passed by parliament are as follows:

- The Law on the Taxes on Environmental Pollution, with appendices: "The main tariffs of taxes on water pollution", "The main tariffs of taxes on atmosphere pollution", "Ways to calculate increased and preferential tariffs";

- The Law on the Taxes for Using Natural Resources, with the Governmental Act "Rates for Taxes on State Natural Resources".

According to the Law on Tax for Pollution of Environment, every 5 years the tax rates are fixed for groups of pollutants based on their hazardous impact on the environment. The listing of pollutants and their grouping is a responsibility of the Government of the Republic of Lithuania and its authorised institutions.

The Law on the Taxes for Environmental Pollution ensures the application of increased and reduced tax rates dependently on environmental pollution. In cases of successful application of measures to reduce pollutant emissions more than 10% with respect to the maximum allowed pollution standards, the law provides for a tax - holiday from the particular pollutant's tax for a period of up to 3 years. If the established pollution standard is exceeded, the responsible person has to pay a fine established by the law. Sanctions for violation of environmental protection requirements in Lithuania are provided for in civil, administrative and criminal law.

If natural resources are utilised without a permission, an entity must pay applicable taxes based on the amount of resources used plus a fine calculated under the established procedure.

The Code of Violations of Administrative Law of the Republic of Lithuania defines various offences relating to environmental pollution and sets administrative penalties. The violations, including unauthorised excessive pollution or emissions, are penalised by fines up to 10,000 LTL (2896€) depending on the type of pollutant and the extent of contamination. The Criminal Code of the Republic of Lithuania provides for criminal sanctions for the pollution of water, land and air which vary from monetary penalties of up to LTL 6,250,000 LTL (1,810,125€) to imprisonment for up to 5 years.

The "Law on the Taxes for Using Natural Resources" sets main taxes for each natural resource used (Keilbach 2006). The rates of taxation for particular types of natural resources are established by the Government of the Republic of Lithuania (taxation on oil and gas is set separately). The Law on Taxes on Oil and Gas Resources provides for the taxation of natural and legal persons that are given the right to exploit oil and gas resources in the territory of Lithuania or in the economic zone of the Republic of Lithuania in the Baltic Sea. The basic tax rate is 20% of the price of oil and gas, which may not be less than the price determined by the Government of the Republic of Lithuania.

According to the "Law on Forests" (approved in 2001) all forests should be managed, harvested and reforested according to the forest management plan. Forest management plans are prepared for 10 years. The Law obliges re-forestation of clear-cut areas within three years after cutting. Forest owners must cover the expenses of forest regeneration from their own funds. In case of natural regeneration, forests have to be regenerated within four years. Lost regenerated areas have to be replanted within two years. According to the "Forest Policy and its Implementation Strategy" approved in 2002, strategic objectives are as follows:

- preservation and increase of the forest resources;
- ensuring of sustainability of forest ecosystems;
- preservation of the biodiversity and improvement of forest health.

In Lithuania, the land tax is not imposed on forest land neither on private nor on state owned. Income tax for round wood sold by natural person makes 15 % of revenues from round wood selling. Legal persons have to pay other taxes to state budget, for example: profit tax (15 % from the net profit) and value added tax (18 %). Additionally to the taxes for legal person state forest enterprises have to pay obligatory 5 per cent deductions to the state budget from forest enterprise incomes for the raw material timber an non-cut forests sold. These deductions are included into state budget and used for financing of the Special Forestry Financing Programme. Many activities and measures in forests of all ownership forms are financed from the state budget through this Programme. It covers state forest survey and inventory, common state forest fire-emergency system, liquidation of natural disasters damages and pest outbreaks, applied

forest research projects, programs implemented by different forestry related institutions, consultation and training of private forest owners, support to private forest owners organisational structures, public awareness raising on forestry issues and etc.

When the privatization of land, forests and other natural resources started, the “Conditions for Use of Land and Forest” were established. According to this document, when an owner receives a land deed, the deed establishes the compulsory conditions for land or forest usage. If a prospective owner does not agree with proposed conditions then land or forest is not given to him. If the owner obtained land in a protected area or close to a water basin where economic activity is restricted, and he started prohibited activities he has to stop doing that and has to pay fines and compensations set by the law (Lygis, 2002).

According to the Law on the Taxes for Using Natural Resources, 70% of charges (for the construction, rehabilitation, maintenance and repair of damage to environmental objects, etc.) are transferred to municipal environmental funds and 30% (compensation for damage caused to the environment, construction and supervision of environmental projects, elimination of environmental pollution sources, increase of natural resources, etc.) are transferred to the state budget. If the limits are exceeded, economic sanctions are recovered from payees' surplus profits and are transferred to the State Fund for Nature Protection. See also Table 1 of the Annex (Law on Value Added Tax, Law on Environmental Pollution Tax, Environmental certification, Integration between economic and environmental interests, More safe products, Investment in environment protection).

Organizations responsible for implementation of regulations

The Ministry of Environment is the major institution charged with the administration and enforcement of the environmental law. Being constituted of various departments and divisions the Ministry of Environment also directly controls a number of agencies, offices and institutions responsible for administration of particular environmental fields, among them:

- State Environmental Protection Inspectorate (principle institution charged with coordination and administration of State control of the environmental protection throughout the country);
- Regional Environmental Protection Departments (responsible for organisation and implementation of the State control of environmental protection and the use of natural resources within a particular territory of the country; they are charged with *inter alia* issuance of the - Integrated Pollution Prevention and Control Permits);
- State Protected Areas Office (responsible for proper security of the protected areas - national and regional parks, reserves, nature heritages and others);
- State Territorial Planning and Construction Inspectorate (supervises and controls territorial planning and construction activities); and
- Geological Survey Office (administers and controls the use of underground resources).
- Management of environmental protection in municipalities of towns and districts is carried out by relevant local municipal institutions, in accordance with the order established by law. Municipalities are in charge of the issuance of construction permits for the majority of types of buildings. Other relevant institutions:
- Committee on Environment Protection of the Parliament of the Republic of Lithuania;
- National Control Commission for Prices and Energy;
- State Metrology Authority;
- General Forest Enterprise.

Civil liability for environmental damage, including the damage concerning biodiversity, is indicated in the Law on Environmental Protection, the Code on Violations of Administrative Act, and the Civil and Criminal Codes of the Republic of Lithuania. The right to bring persons guilty of the violation of environmental law to account is regulated in the Code on Administrative Offenses of the Republic of Lithuania (approved in 1994). Environmental

provisions are also included in several Articles of the Criminal Code of the Republic of Lithuania (Article 245 - on offenses against environmental laws; Article 245 - on water, soil and air pollution; Article 330 - on illegal hunting; Article 331 - on illegal fishing or catching of rare and endangered animals, etc.).

The function of Implementing Agency for environmental projects is performed by Environmental Projects Management Agency (EPMA) of the Ministry of Environment. EPMA manages the environmental protection projects funded from the EU Cohesion Fund and Structural funds, and also supervises the implementation of the projects funded by Instrument for Structural Policies for Pre-Accession (ISPA) fund. EPMA manages the projects of environmental protection financed under Measure 1.3 of the Single Programming Document (SPD). The main objectives of Measure 1.3 of the SPD are as follows:

- to reduce the pollution of water, air and soil as well as its danger to the regions of Lithuania;
- to ensure the public's right to safe and clean environment;
- to avoid and reduce the negative impact of economic and other activities on the environment by keeping the use of natural resources sustainable;
- to establish a responsible public attitude towards the natural environment.

The use of natural resources and environmental quality regulations also falls under the jurisdiction of the Ministry of Agriculture, the Ministry of Health and the Ministry of Economy.

Involvement of companies in managing of impact evaluations, compensations and mitigations

„Šiaulių bankas“ bank is one of the leaders in crediting environmental projects. It was the first bank to sign an agreement with the Lithuanian Environmental Investment Fund (LEIF) and Investment Guarantee Fund and its representative participates in the Supervisory Board of the fund (Annex: Table 1, Investment in environment protection). The Fund finances private and public sector implementing water, hazardous waste management, waste recycling, renewable energy and energy efficiency projects on easier terms (via subsidies and soft loans). The bank funded 30% of all municipal and private projects subsidised by the LEIF in 2006. The future plans of the bank include renewable energy projects and energy efficiency financing in buildings, especially older apartment blocks.

In Lithuania, there is applied the highest pollution tax rate. On the other hand, Lithuania has pollution taxes exemptions for biofuels used in mobile pollution sources. There are attempts to implement the CO₂ tax in sectors not covered by emission trading, namely, in transport sector. (Klevas et al. 2007).

Lithuania is the only Baltic State applying VAT exemptions for biofuels. This has a positive impact on the promotion of biofuels use in transport sector and on the implementation of requirements of Directive 2003/30/EC, and on the promotion of plant's capacity and its commencing time to receive such a support (Miškinis et al. 2006). The Law on Amendment of the Excise Law adopted in 2004 provides for the power produced from the renewables to be exempted from the excise tax; an excise grace is applied to the part of biofuel corresponding to the part of additives of biologic origin in one ton of the product. The Law on the Environment Tax as well as the Laws on the Supplement and Amendment of the said Law establish that legal and natural persons shall be exempted from the tax applicable for environment pollution by mobile and stationary pollution sources if the said persons use standard biofuels and provide written evidence of the usage of said biofuels.

Ministry of Economy intended to cover 75% of the EU Eco-Management and Audit Scheme (EMAS) certification costs for SMEs and 50% for ISO 14001 for SMEs in 2006 (Baseline study on Corporate Social Responsibility practices in Lithuania 2007. United Nations Development Programme. Public Policy and Management Institute).

At the end of 2007, together with direct payments for agricultural holdings and crop areas, the first payments under the following Lithuanian Rural Development Programme for 2007-2013

were made: “Payments to farmers in areas with handicaps, other than mountain areas”, “Agri-environmental payments”, and “Natura 2000 payments and payments related to Directive 2000/60/EC.” By the end of 2007, a total of almost 95 400 000 LTL (27 629 750€) was paid out to farmers. The greatest amount of support was paid out under the Rural Development Programme measure “Payments to farmers in areas with handicaps, other than mountain areas” – approximately 95 million litas. Over 332 000 LTL (96154€) was paid out to farmers under the measure “Agri-environmental payments”. By the end of 2007, the amount of support paid out under the measure “Natura 2000 payments and payments related to Directive 2000/60/EC” (support for agricultural holdings located in the Natura 2000 territories) equalled almost 56000 LTL (16219€). (“National Paying Agency under the Ministry of Agriculture. Annual report 2007”). However, the main problems with Natura 2000 focus on the fact that for many privately owned sites the compensation mechanisms are not yet operational. Still, Lithuania anticipates funding through the LIFE program and some actors are preparing to receive co-financing funds (Keilbach 2006).

The most important goals pointed out in the Agricultural and Rural Development Strategy (2000) are environmental protection and ecological farming nurturing biodiversity and landscape where partial financing of the construction of manure yards is emphasized (“Lithuania’s Report on Demonstrable Progress in line with Decisions 22/CP.7 and 25/ CP.8 of the UNFCCC”). Also, Lithuania has different plans according to the type of advice that farmers’ request:

- for advice on cross compliance the Rural Development Plan (RDP) will cover 80% (with a maximum contribution of 1200€/per year) and the remaining 20% will be paid by the farmer;
- advice for organic farming and environmental programmes: 80% (max 1000€) from the RDP and 20% from the farmer;
- advice about quality of accounting in farms: 50% (max 600€) from the RDP and 50% from the farmer;
- advice for forestry: 80% (max 500€) from the (RDP) and 20% from the farmer;
- advice about preparation of business plans for investment projects – 50% (but not more than 5% of total eligible costs) from the RDP and 50% from the private farmer’s funds (Miškinis et al. 2006).

See also the Annex: Table 1 (Conservation and sustainable use of natural resources; Safe products; Environmental certification; Integration between environmental and economic interests).

Measures taken by companies (private or public) concerning Biodiversity conservation and research and National Business & Biodiversity Initiative

Measures of companies contributing to the conservation of biodiversity

Accounting of impact on biodiversity by the companies

At present, industry and other stakeholders in Lithuania do not consider the accounting of impact on biodiversity. However, the biodiversity can be positively affected through the environmental management accounting and environmental impact assessment. Environmental management accounting (EMA) can be defined as the generation, analysis, and use of financial and related non-financial information in order to integrate corporate environmental and economic policies and build sustainable business (Staniškis and Stasiškiene 2003b). In general, accounting can be divided into financial accounting, which is regulated by laws, standards and guidelines and is intended for external users such as shareholders and tax authorities, and management accounting, which is intended to help decision makers within the company (Stasiškiene 2001).

Environmental impact assessments (EIA) of companies' operations are relatively widespread in Lithuania, and according to a socio-economic survey "What does business think about corporate social responsibility?" they are conducted by 59% of respondent companies. Non-financial services companies, small, and medium companies conduct fewer than average number of EIAs. The incidence of EIAs tends to increase with companies' size. During the last three years, 68 percent of Lithuanian companies were engaged in environmental projects (Annex: Table 2). In order to implement their environmental projects, most companies collaborate with a number of institutions that can be categorized as: municipal institutions; governmental institutions; public institutions, and other businesses.

One of indicators of low environmental impact is the share of innovative, environmentally clean technologies in the economy. The percentage of innovative enterprises in Lithuania varies from 21 to 65 according to enterprise size. The higher results are in large enterprises than in SMEs. Lithuanian SMEs in 2004 had 6.5 % of innovation expenditure as a percentage of turnover in industry sector and 3 % of innovation expenditure in services sector as a percentage of turnover. In Lithuania, the SMEs are generally less innovative than the large enterprises. Lithuanian SMEs with innovative activity and the results showing innovative actions are in the middle among the EU countries; in some cases the ratios are above the average (Krišciunas and Greblikaite 2007).

The most innovative companies to be mentioned are as follows:

“Utenos Trikotažas” (textiles and clothing company) has acquired the ISO 14001 certificate (the first implementation among Lithuanian clothing and textiles companies); SA 8000 – the first implementation in Lithuania; OEKO -TE X 100; EU Flower – the first implementation in Lithuania. As the result of regular investment and process modernisation, „Utenos trikotažas“ managed to decrease its environmental impact. The usage of energy, water and raw resources per unit of output as well as pollution and waste has decreased.

UAB¹ „Narbutas & Ko“ (office furniture) selects its suppliers according to reliability and reputation; environmental, quality and sustainable forestry certificates are demanded from suppliers. Quality and environmental management systems (ISO 9001 and ISO 14001) have been implemented; they contributed to the decrease of environmental impact significantly. The company willingly accepts interns and collaborates with the higher education institutions.

AB „Achema“ (chemicals) - the largest in the Baltic States, was given the „most environmentally-friendly process“ prize for the implementation of a zero-waste technology. „Achema“ is one of the top ten chemical companies in the EU having the lowest pollution per unit of product indicators. It was also one of the first large Lithuanian companies to receive an integrated pollution prevention and control permit (IPPC).

UAB "Dinaitas" has been formed of the professional staff, large data basis of waste water treatment has been created, a modern technology for WWT equipment production has been implemented, and divisions of WWT equipment design, production, mounting, maintenance and sales have been established. JSC "Dinaitas" is closely cooperating with scientists of Water Management Department of Vilnius Gediminas Technical University (VGTU), regional construction organizations and municipalities. Its biological WWT plant "ORIS" was nominated "The Product of the Year 2001 in Lithuania. All the activity of the company is certified with ISO 9001 and ISO 14001 (quality management and environmental management systems).

“Mestilla” UAB belonging to Linas Agro Group was established on 17 March 2005. The main activities of the company include production of methyl ester. In 2006-2007 the company implemented an investment project of EURm 38 – built one of the most state-of-the-art plants in Europe to reprocess rapeseed into environment-friendly fuel – biodiesel – in Klaipeda Free

¹ Joint-stock Company

Economic Zone. The plant will produce over 100 thousand tons of environment-friendly fuel every year. Suppliers of the key raw material for production – rapeseed – will be long-term partners of the Group – the Lithuanian farmers. Mestilla UAB is a member of the Biofuel Association and takes active part in developing the National Biofuel Technology Platform. By producing biofuel the company will contribute to energy policy goals of the Republic of Lithuania and the European Union defined in the White Paper: “Energy for the Future – Renewable Sources of Energy” providing for the European Community Strategy and the action plan, the Kyoto Protocol, the Law of the Republic of Lithuania on Energy and the National Energy Strategy.

Main measures taken by companies to minimize impacts

Fast implementation of progressive environmental protection measures, cleaner production methods and environmental management systems (ISO 14001 standard) could prevent the increase in negative impact on the environment from industries. (Lideika et al. 2005). Leading companies are now active in the field of CP (cleaner production) and EMS (environment management systems) (Staniškis and Stasiškiene 2003a; Ruževicius et al. 2004; Kliopova and Staniškis 2006a). Standardised quality management systems are quite common among Lithuanian enterprises. Environmental management systems ISO 14001 have been implemented in 267 companies in 2007 (Baseline study... 2007; Ciegis et al. 2008). Also eco-labelling schemes are starting to spread, as well as product take-back schemes (Stasiškiene 2001; Ruževicius and Waginger 2007; Grundey and Zaharia 2008; Staniškis et al. 2008). In Lithuania also environmental label “Lily” was created in 1996, but still no one product has got it. New label, the “Natural Lithuanian product”, was recently developed in Lithuania. It indicates that the product is made by organic farming only, and is clean and healthy. The most popular Lithuanian eco-certification scheme is “Ekoagros 20”:

- twenty-one companies have got the certificate for some of their products;
- in total, there are about 135 food products certified by Ekoagros;
- there are 2348 eco-farms in the country, in total comprising 102120 hectares, or almost 4% of all agricultural lands.

A study performed by Lithuanian Statistics showed that only 17% of interviewed enterprises aimed to reduce the environmental impacts through innovation (Uselyte 2004). Taking into consideration environmental aspects into product design, usually companies focus on a single, specific issue (whether for legislative, market or economic reasons) and do not use life cycle considerations in the product design. Most typically the consideration of environmental aspects in products have been realized in following directions:

- replacement of hazardous substances (both in products and processes), especially in chemical, textiles, wood and wood processing industry and metal processing industry;
- those dealing with the use of packaging (due to the packaging legislation);
- improvement of quality and economy of the product (reduced raw material consumption, products with higher quality and better features – so called “win-win” solutions both for economy and environment).

ISO 14001 certifications are usually acquired by companies having more international relations. None of the Lithuanian companies have got the EMAS certificate so far. (Baseline study... 2007. United Nations Development Programme. Public Policy and Management Institute; Ruževicius 2008). It is advisable to make a correction in Lithuanian public procurement laws validating the possession of environmental management (ISO 14001 or EMAS), product quality and environmental certificates (Ruževicius 2008).

Types of actions contributing to the conservation of biodiversity

Recently, Lithuanian companies are expanding their investments into ecologically clean technology in the form of environment friendly projects.

For example, Hermis Finansai is one of the leading investment banking firms in Lithuania, the largest and longest established organisation of corporate finance firms specialising in the middle market. In 2004 Hermis Finansai agreed to a full merger with LHV, the member of M&A International. In 2005, LHV successfully arranged project financing for a 30 MW installed power 15 turbine wind park being developed by UAB "Veju spektras" and located in Vydmantai in Western Lithuania. The total value of the project is LTL 136 m. LHV structured the deal and raised both debt and equity financing. The latter was provided by financial investors as well as Enercon GmbH, a German producer of wind turbines. It is planned that all construction works will be finished, and the park will be connected to the AB "Lietuvos energija" grid in one year. It is expected that the annual energy production of the park will reach 70 million kWh, which constitutes approximately 1% of annual energy consumption in the country. UAB "Veju spektras" also have plans to receive additional revenue by selling CO₂ emission reduction credits, as soon as such an option becomes legally possible. The project was credited by UAB "Hansa lizingas". Law company Bernotas & Dominas Glimstedt were legal advisors for the project; UAB Elektromontuotojas developed its project under the Leonardo da Vinci program "Improvement of Electric Engineering Profession Competencies through the Use of Environmentally Friendly Cable Installation Technologies". The project was implemented in cooperation with Kaunas Technical College, Visaginas Technology and Business Vocational Training Centre, Lithuanian Training Centre for Power Engineers and Vetter GmbH Kabelverlegetechnik (Germany).

The GEF Small Grants Programme implemented by UNDP has been operating in Lithuania since 2001. The projects are excellent examples demonstrating how local communities reconcile their economic and social interests with the environmental conservation needs (Linking the Interests... 2004) (See also Annex: Table 3).

In September 2007, the team of Lithuanian designers - Seržas Gandžumianas, Sandra Straukaite, Jolanta Rimkute, Vitalijus Cepkauskas, Daiva Urbonaviciute, Giedrius Paulauskis and others – organised an original action "Designers for Environment Protection" in Vilnius. During the campaign, everyone who brought 20 plastic bags could exchange them into the bags created by famous Lithuanian designers and made from environmentally-friendly materials, such as recycled paper, cotton, linen. The campaign was aimed to show the citizens into which dumpsites our cities can turn, if we are not concerned about damage caused to environment. The telecommunications company TEO approved this idea by joining and supporting this action.

The state of the National Business & Biodiversity initiative

In Lithuania, the Business & Biodiversity initiative has not yet launched. However, some related activities are going on. One of the areas where Lithuania is quite active is the Corporate Social Responsibility (CSR) concept (<http://www.acceleratingcsr.eu/en/>). It includes integration by companies social and environmental concerns in their business strategy and operations and in their interactions with stakeholders on a voluntary basis.

Environmental issues of the CSR include management of waste, water, energy, hazardous substances, and biodiversity, as well. Every organization chooses how it would like to implement the corporate social responsibility and accountability concept into its daily practices. One of the best known international networks of socially responsible businesses is Global Compact, presented by the United Nations (UN) in 1999 (Kmieliauskaite 2005). Responsibility for CSR as a public policy has been assigned to the Ministry of Social Security and Labour of the Republic of Lithuania (Baseline study on Corporate Social Responsibility practices in Lithuania). Three employees of the Ministry have some connection to this responsibility, however neither of them has CSR as his/her explicit duty (see Annex: Table 4). The Ministry has approved the Plan on the means of CSR promotion in 2006-2008. This plan lists some important activities: yearly awards, training, monitoring, etc. However, most of the concrete steps are still to be taken and

the outcome still remains to be seen. The funds for the development of CSR are allocated both from the state budget and the European Union structural support for 2007–2013. The Ministry of Social Security and Labour publishes some information on CSR on its web-site www.socmin.lt/index.php?-15759657151. Other ministries (Ministry of Economy or Ministry of Environment) are not strongly involved. There are no divisions or employees responsible explicitly for CSR in these ministries. However, there are some activities of these ministries, related to CSR - the Ministry of Environment is preparing a program to encourage the green procurement; the Ministry of Environment and the Ministry of Economy have established awards for well performing businesses. Lithuanian Development agency organised conference on CSR for SMEs.

The National Network of Responsible Business (the UN Global Compact initiative) was started in 2005 and currently involves 45 companies and organisations that have implemented the corporate social responsibility (Staniškis et al. 2008) (see also Annex: Table 5).

The role of CSR in the main sectors of economic is following (Baseline study on Corporate Social Responsibility practices in Lithuania):

Agri-business. Agri-business is considered to be one of the most problematic sectors in Lithuania for CSR, especially SMEs. Yet the importance of CSR in this sector will increase in the future as the population is becoming more educated and more conscious of the food quality. The proliferation of organic certification of food products is an important sign;

Chemical, oil and gas business. Chemical, oil and gas companies have inherited a poor technology and environmental legacies from the Soviet times; however, their rapid modernisation in the context of the EU accession allowed addressing the environmental and technology problems. The pollution emissions have decreased by a few times and may often qualify for the best available technology standard. Many companies consider CSR policies as a must in their activities;

Extractives. Today half of Lithuania's forests are owned privately. The largest problems associated with CSR are related to illegal logging etc., but the statistics shows a decrease of such trends in recent years;

Service and finance. Service and finance companies have many things in common in CSR context. The most attractive employers in today's Lithuania are either service or finance companies. Many finance and service companies belong to the UN Global Compact initiative. However, socially responsible investing is still a novelty among Lithuanian banks;

Trade. The largest retailers in Lithuania are still quite conservative and have a huge potential for CSR implementation and areas of improvement. A recently signed Code of Ethics of Trader's Goodwill may bring some constructive approach into the relations with suppliers, which have been tense (since few supermarket chains completely dominate the retail market). The largest Lithuanian supermarket chains are not very open to organic and environmentally certified products. Only one of the three largest retailers has a line of organic, fair-trade and ecological products.

In 2006, the Institute of Labour and Social Research under the Ministry of Social Security and Labour and the Tripartite Council prepared a guide on CSR. This guide reveals the essence of CSR and shows the perspective for the development of socially responsible business. It must be stressed that Lithuania is still experiencing the first steps in CSR (Baseline study ...).

Biodiversity research supported by private companies

Assessing of the existing or past research activities in partnership with the private sector and the public companies in the field of biodiversity

An example of biodiversity research in partnership with private companies represents the Integrated Science, Studies and Business Centre ("Valley") for the development of the marine sector of Lithuania. The Valley creates the knowledge-based economy cluster concentrating

territorial marine science and studies institutions and their subdivisions, optimising with the help of the common infrastructure their interaction and facilitating closer synergy of marine science, studies and business. The initiative to establish the Integrated Science, Studies and Business Centre (Valley) for the development of marine sector of Lithuania was launched by public bodies carrying out research in the area of marine science: Klaipeda University, Institute of Geology and Geography, Institute of Ecology of Vilnius University, Institute of Botany, Institute of Psychophysiology and Rehabilitation of Kaunas University of Medicine. The establishment of the Valley is supported by: Klaipeda County Governor's Administration is responsible for the strategic development of the maritime of Lithuania, aims at ensuring further sustainable development of the region in cooperation between business and academic community and is implementing the Baltic Sea Coast Preservation and Restoration Programme by decision of the Government of the Republic of Lithuania. Administration of the State Enterprise Klaipeda State Seaport (AKSS) is responsible for the administration and development of the port, ensuring safe navigation and environmental protection. The main purpose is to ensure continuous development of the port, maintain its competitiveness and increase cargo-handling volumes. The National Fish Hatchery and Fisheries Research Centre of Lithuania is interested in the development of marine aquaculture and fisheries. The establishment of the Valley in the maritime region will contribute to the implementation of priorities enshrined in the National Sustainable Development Strategy of Lithuania: reducing environmental impact of the maritime complex and other key industries; more effective utilisation of natural resources and waste management; mitigation of the global climatic change and its effects; improved protection of biodiversity; improved protection and sound management of landscape; strengthening the role of education and science; and use of alternative energy sources (geothermal waters, wind and wave energy). The initiators of the Valley include knowledge intensive associations of business entities: Association of Lithuanian Producers of Fishery Products; Confederation of Fishermen and Fish processing Enterprises of Western Lithuania; Lithuanian Ship Owners Association; Association of Lithuanian Shipbuilders and Repairers; Association of Lithuanian Stevedoring Companies; Association of Industrialists of Klaipeda; Klaipeda Chamber of Commerce, Industry and Crafts; Association of Geologists; Association of Lithuanian Wind Plants; Confederation of Lithuanian Industrialists; Lithuanian Intermodal Transport Technology Platform. The following private business entities of the marine sector are planning to develop their activities in the Valley: AB Vakarų laivų gamykla, AB Baltijos laivų statykla, UAB Laivų servisas, and UAB Laivų technika – shipbuilding and repairs; AB Limarkas Shipping Company – transport and logistics services; UAB Klaipėdos terminalo grupė – cargo handling works in ports; UAB Belam telekomunikacijos – marine telecommunications; UAB Grota – environmental technologies; and UAB GeoBaltic – distant research (Integrated science...).

Activities of the companies of **Litagra Group** include primary production in the segments of crop production and of livestock farming, processing and services for the agricultural market as well as engaging in wholesale and retail trade with plant growing and animal breeding production in Lithuania, Latvia and Estonia. In 2003, Litagra Group established public enterprises “The Foundation for the Development of Nature Protection Projects” and “The Foundation for the Development of Agricultural Sciences” which both aim at contributing to the improvement of ecological and educational system in Lithuania. Right from the day when the Foundation was first founded, the Company pursues the policy of independent support whereby it does not take into account, whether the production involved in the research activities represents a respective company or any of its competitors, and does not restrict the researchers in terms of any predetermined topics of research, hence encouraging the researchers' initiative and paying due regard to their scientific interests. In the implementation of the Programme on the Formation and Management of Field Crops Yield and Quality Potential, a very active role is undertaken by the Lithuanian Institute of Agriculture (LIA) which is responsible for the selection

of applications pursuant to the provisions of the tender as well as for the administration and coordination of research activities, evaluation of research outcomes and making them available for the stakeholders.

Vilnius State Forest Enterprise (VSFE) is another good example of stakeholder engagement: VS FE provides qualification improvement courses in Lithuania and abroad for employees, free of charge consulting to private forest owners and collaborates with forest owners' associations; VSFE information system was created, which contains forestry library, historical forestry exhibit, environmental and awareness raising materials; support local forestry science and biodiversity preservation collaborating with Lithuanian Ornithological Society. Lithuanian Green Movement is a strong partner of VSFE in forest policy making.

For other examples see also the Annex: Table 3.

Ecological engineering

State of the art of ecological engineering applied to industrial impact assessment and restoration / mitigation

Industrial ecology may be seen as a combination of a scientific field and the practical industrial sector where environmentally sound processes may be tested and implemented (Staniškis and Stasiškiene 2006b). The EU accession process of Lithuania required the harmonization of environmental law, which refers to both environmental legislation and enforcement. Cooperation of industries in innovation development is seen as a process during which environmental sustainability principles and methods are used to raise environmental awareness.

Taking into consideration that in the industry of Lithuania the share of environmentally friendly high tech enterprises is small, the role of science institutions in the development of high tech is very important. The national innovation system approach was manifested at the different policy level, such as Industrial development, Business development policies, etc., but the actual integration of efforts started with the Lithuanian White Paper on Research and Development (R&D) and Technology (2002) and its implementation programme, which foresees most challenging task for Lithuania – development of corporate research, which should provide an input for R&D based innovations in business. There is an established framework of business and innovation support organisations. This includes business incubators, technology parks and innovation centres (see Table 1 of Appendix (Economic Categories); Table 5 (Sustainable Business). Linking the R&D system with the country's industrial structure via application of R&D results in traditional mid-low tech industries remains a conceptual and practical task for both, R&D and economy policies (Country Review...; Gudauskas and Gatautis 2006).

The activities of the following academic organizations are related to the field of industrial impact assessment and mitigation:

- Kaunas University of Technology, Faculty of Economics and Management and Institute of Environmental Engineering;
- Lithuanian Energy Institute, Laboratory of Renewable Energy, Laboratory of Energy Systems Research, Energy Efficiency Research and Information Center; Hydrology Laboratory;
- Lithuanian University of Agriculture, Water Management Department, Department of Land management;
- Mykolas Romeris University, Faculty of Economics and Finance Management, Department of Economics;
- Vilnius Gediminas Technical University, Faculty of Business Management, Department of Finance Engineering, Faculty of Environmental Engineering;

- Vilnius University, Faculty of Communication and Faculty of Economics & Business Ethics Centre;
- Vytautas Magnus University, School of Political Science and Diplomacy, Department of Public Communication.

Of these, the Institute of Environmental Engineering of Kaunas University of Technology (APINI) is the main promoter of the three pillars of sustainable industrial development – economic viability, environmental protection and social responsibility and believes that a sustainable research is a pre-condition. That is, “An inactive company that remains indifferent to the changing environmental realities is likely to hit the wall and go out of business. The goal of a sustainable organization or a sustainable society is to direct its activities and investments to the centre of the funnel rather than towards the wall” (Ciegis and Grunda 2006). Main research areas at APINI:

Sustainable industrial development: policy advice, policy oriented research from a broad multi-disciplinary perspective; promotion the implementation of policies, programs, laws and regulations based on sustainable development; strengthening industry and facilitate industry-government interaction through collaboration in sustainability fields; serving as a source of expertise and advisory services for the government, private sector, and non-governmental sustainability initiatives. Dissemination of research findings and public education through the media, conferences, seminars, lectures, publications and curricula development.

Environmental management: theoretical and practical EMS implementation in various organizations, including requirements of Eco-Management and Audit Schemes (EMAS and ISO 14001 standard and preventative systems; methodology of preventative EMS implementation that enables to achieve most efficient layout of EMS and provides increasing environmental performance and effective cost savings; the research covers the fields: nature, environment and energy management, i.e. industry management problems in relation to the use of nature, environment, and energy. The research is problem based, interdisciplinary and application oriented, and its overall goal is to contribute to a sustainable use of natural resources; a part of the research aims at improving the tools in areas such as life-cycle assessment, environmental impact assessment, and energy planning.

Environmental Impact Assessment (EIA) and chemicals’ risk assessment and control: theoretical and practical development of chemical management systems; Chemicals Risk assessment; Analysis of the chemicals control systems – the current system and REACH; Development of POPs Implementation Plan (inventory of POPs, management options, including phasing-out and risk reduction options).

Eco-design, Life Cycle Assessment: eco-design is a redesign of a product reflecting environmental considerations in the entire life cycle of the product in order to decrease the environmental impact and the increase the product competitiveness. Eco-design is life cycle based information, which is most often provided by lists of materials, substances and processes; Life cycle based data often has the form of an environmental product declaration when communicated externally; Effective two-way communication in the supply chain, identification and prioritization of significant environmental aspects-are the key research issues in the area.

Integrated waste management: overall picture of the waste management process based on strategic planning where different waste streams and waste prevention are included. Looking at the overall environmental burden of the system is the only rational approach; otherwise reductions in one part of the process may result in greater environmental burdens elsewhere. By looking at the wider boundaries of the whole system it is possible to determine whether the whole system operates efficiently and where it could run at break even, or even at a profit.

Water Quality Modelling and Water Resource Management: provide information needed for sustainable management of watersheds at a landscape scale under dynamic influences related to human activities and changing environmental conditions. Provide the scientific information, in

cooperation with other scientific disciplines, required for sustainable management of coastal environments, including relationships to the human dimension and footprint. Develop and implement quantitative and predictive models designed to assist resource management decisions that link management actions to ecological outcomes. Create and adapt existing tools and technologies from other disciplines to address water resource management questions.

The Centre of Business Ethics (Vilnius University) conducts research, provides services (e.g. analysis of organisational culture) and offers education and training in the field of business ethics. These courses are included into the curricula of economics and management degrees. Mykolas Romeris University started the Master study program on the Policy of Sustainable Development in 2007. At the Lithuanian Energy Institute research related to rational use of biomass resources in biofuel production, solid biofuel use to produce heat and electricity energy, utilisation possibilities of renewable and waste energy sources, environmental impacts of the energy sector, pollution reduction technologies and implementation of environment protection policies is carried out. The Vilnius Gediminas Technical University conducts research on solution of economic problems in environment protection. At the Lithuanian University of Agriculture research on landscape improvement, farming and environment, land use planning under land reform, non-point pollution in rural areas, renovation of lakes; flood risk assessment, development of water management methods in irrigation and drainage systems is carried out.

An example of non-governmental organization, related to ecological engineering, is the Environment Management And Audit Institute (EMAI). The institute has been founded in 1998 by the initiative of the Engineering Ecology Association (established in 1994), in cooperation with the Lithuanian Industrialist Confederation, pursuing improvement of ecological situation in Lithuania and the whole Baltic Sea Region Major activities of EMAI:

- Prepares companies for integration into the EU;
- Organizes and develops activities related to environment protection management and audit, carries out audit of conformance and managerial environment protection audit;
- Carries out audit of environment protection issues for enterprises, banks, insurance companies;
- Prepares and issues methodical material and advices, which help enterprises and organizations implement management of environment protection in accordance with the requirements of the standards of EN ISO 14000 series;
- Drafts projects of state environment protection management and audit programs and projects of the country's environmental policy and legal documents, in cooperation with science and education institutes of the country, as well as with business enterprises;
- Organizes and coordinates implementation of environment protection management systems in Lithuania.

Examples of good practices applying industrial impact assessment are listed in the Annex: Table 6.

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ANNEX

Table 1.

The main legal acts contributing to environmental impact assessment and Corporate Social Responsibility (CSR) (Advokatu kontora Baranauskas, Sesickas, Stukas ir partneriai |APEX LEGAL).

Legal act and its statements considering relation of companies to environment, including those impelling CSR	Implementing legal acts (if present)	Contribution of the legal norm to the CSR
INTEGRATION BETWEEN ENVIRONMENTAL AND ECONOMIC INTERESTS		
<p>Law on Environment protection (“Valstybes žinios” (Official Gazette), 1992, Nr. 5 –75; 2005, Nr. 47- 1558)</p> <p>§28. Ecological and economic interests of the State shall be coordinated by the economic mechanism of environmental protection set forth in the laws and other legal acts of the Republic. This consists of: 1) taxes for the utilization of natural resources; 2) taxes for environmental pollution; 3) regulation of crediting; 4) state subsidies; 5) pricing policies; 6) economic sanctions and compensation for damages; 7) other ecological taxes and measures.</p> <p>§29. Implementation Methods of Economic Environmental Protection Measures: the introduction of low waste technology and the manufacturing of ecological production shall be promoted by tax reduction, credit privileges, and state subsidies.</p> <p>§30. State Financing of Environmental Protection Measures: Environmental protection measures shall be financed by the users of natural resources, the state government, and local governments. State budget funds allocated for environmental protection shall be utilized in accordance with the directions and programs determined by the Government of the Republic of Lithuania and the Department of Environmental Protection. Additional sources of environmental financing shall be the State Fund for Environmental Protection and the local government funds for environmental protection. The Supreme Council of the Republic of Lithuania shall establish the procedure for the formation and distribution of the State Fund of Environmental Protection</p>	<p>The procedures of funding according to the Program of Support of Environment Protection are foreseen by the Law of the program of support of environment protection (“Valstybes žinios”, 2000, Nr.: (92 - 2872) and the Law of the Special Programme of the support of environment protection (“Valstybes žinios”, 2003, Nr. 61-2760)</p> <p>The Value Added Tax (VAT) rate is reduced for the organic and environment-friendly products and for the State subsidies, loans and credit exempts for environmental projects financing.</p>	<p>The Law provides an economic regulation mechanism for private companies, supporting CSR.</p> <p>The subsidies of state budget are foreseen for the environmental projects of private companies.</p> <p>The established financial support mechanism, the sources and the priorities promote a responsible attitude of companies to the environmental values and support the CSR</p>
CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES		
<p>Law on Environment protection (“Valstybes žinios”, 1992, Nr. 5 –75; 2005, Nr. 47- 1558)</p> <p>§14. The users of natural resources are obliged to assess the impact of their activities on the environment by their own sources and funds; to use the natural resources in a rational and sustainable way; to apply measures eliminating or minimising the negative impact <...></p> <p>§15. <...> The legal and natural persons planning their business estimate, define and assess the potential impact of it on the environment by their own funds; they prepare all necessary documentation and submit it to the participants of the environmental impact assessment process according to the</p>	<p>Lithuania has ratified the Convention on Biodiversity in 1995 and prepared a National Biodiversity Conservation Strategy and Action Programme that was adopted in 1996. The main goals of the Strategy and Action Plan are to conserve the country's major ecosystems, species and communities.</p> <p>Implementing the Convention and the Plan, Lithuania has adopted the Law on the Wild Vegetation, the Law on the</p>	<p>The Law provides the norms and standards of environment protection, the limitations for the exploitation of various natural resources, including biodiversity resources, the requirements of environmental impact assessment, impact prevention and mitigation, environmental monitoring, the means and cases of environment restoration. Clear statements of the Law concerning mandates of responsible institutions as well as the requirement to any business to invest in smaller or larger scale into the environment protection ensure the implementation of the CSR.</p>

legislation <...>	National Genetic Resources of Plants, the Law on Preservation of Plant Strains, the Law on Wildlife, the Law on Protected Species of Animals, Plants and Fungi and their Communities, etc.	
<p>Law on environmental impact assessment (EIA) for planned economic activities (“Valstybes žinios”, 1996, Nr. 82- 1965; 2005, Nr. 84 - 3105).</p> <p>§4. The purposes of the environmental impact assessment shall be to:</p> <p>1) determine, describe and evaluate any potential direct and indirect impact of a proposed economic activity upon public health, flora and fauna, soil, surface and subsurface of the Earth, air, water, climate, landscape and biodiversity, material values, immovable cultural values heritage and interaction among the aforesaid components of the environment;</p> <p>2) reduce or avoid the negative effects of the proposed economic activity on public health and other components of the environment referred to in item 1) above;</p> <p>3) determine whether a proposed economic activity is permissible in the chosen location given the nature and environmental impact of the proposed economic activity.</p>	Order Nr. D1-509, 2007, on the Biodiversity protection and protected areas protection and management Programme 2007-2013 for implementation of the EU Structural Support strategic priorities (“Valstybes žinios”, 2007, Nr. 107 - 439)	<p>If planned economic activities (including the construction of new structures, the reconstruction of the existing structures, etc.) due to their type, scope or the specific features of the projected site may have a significant effect on the environment, environmental impact assessment should be prepared at the expense of the planner before the preparation of its project. A list of such activities is presented in the appendices to the Law on Environmental Impact Assessment of Planned Activities: Annexes of the EIA contain two lists: the List of Types of Planned Economic Activities Subject to the Environmental Impact Assessment (Annex 1) and the List of Types of Planned Economic Activities Subject to Selection Related to the Mandatory Environmental Impact Assessment (Annex 2). The environmental impact assessment shall be performed:</p> <p>1) when the planned economic activity is entered into the List of Types of Planned Economic Activities Subject to the Environmental Impact Assessment;</p> <p>2) when it is established during the selection process that the planned economic activity has to be subject to the environmental impact assessment;</p> <p>3) when the implementation of the planned economic activity may have an impact on the areas of the European Ecological Network Natura 2000, and the authority in charge of the organisation of the security and management of protected areas (the State Service for Protected Areas) establishes that such impact may be significant, following the procedure prescribed by the Ministry of Environment.</p>
<p>National Energy Efficiency Programme 2006-2010 approved by Order Nr. 443 2006 - 05-11 of the Government the Republic of Lithuania (“Valstybes žinios”, 2006, Nr. 54-1956)</p>	Order of the Minister of Economy for the approval of the Energy Efficiency Action Plan (“Valstybes žinios”, 2007, Nr. 76 - 3024)	Measures, stimulating decreased consumption of all form of energy are established
<p>Law on the Energy (“Valstybes žinios”, 2002, Nr. 2224; 2007, Nr. 55-2124)</p> <p>§3. The main principal objectives of the low are:</p> <p>2) efficiency of energy consumption;</p> <p>3) reduction of the negative environmental impact;</p> <p>5) promotion of consumption of indigenous and renewable energy sources</p>	<p>Legal acts, stimulating use of bio-fuel and other renewable energy sources</p> <p>The Government accepted the Resolution No. 25 on 13 January 2004 on procedure on promotion of generation and purchase of electricity generated using renewable and waste energy sources, which was edited on 2005 (Amendment of Resolution</p>	<p>It has been delineated necessity of stimulation of increased consumption of renewable energy sources, namely: security of energy supply and reduction of the negative environmental impact.</p> <p>Fixed tariffs and tax privileges are established for renewable energy sources, including bio-energy, and other measures,</p> <p>It is foreseen that green certificate scheme, as the instrument gaining more support within the EU, will be implemented in Lithuania by 2010. However, in the Resolution No. 627 of</p>

	No. 627, 2005).	the Government of the Republic of the Lithuania, 2005, it is stated that this market-oriented measure will be introduced since 2021
Law on Construction (“Valstybes žinios”, 1996, Nr. 32 - 788; 2001, Nr. 101-3597) §6. Protection of the Environment, Landscape, Immovable Cultural Heritage Properties and other Types of Protection (Safety). 1. Construction investigations, design, construction must be carried out in compliance not only with this Law, but other laws, legal acts and normative documents regulating: 1) the environmental protection and the assessment of an impact of planned economic activities on the environment; 2) protected areas, landscape preservation, <...>	Order by Minister of Environment for approval of regulation 2.01.01(3): 1999 “Main construction requirements: hygiene, health, environmental protection” (“Valstybes žinios”, 2000, Nr. 8- 215)	Considerations of the environment protection and the assessment of the impact on the environment are obligatory while explorations before construction, preparation of the project and construction itself. The obligation of companies to harmonize the construction activities with the environmental requirements is important factor promoting the CSR.
Law on Natural Resource Tax (“Valstybes žinios”, 1991, Nr. 11-274; 2006, Nr. 65, - 2382) §4. The object of tax <...> 3) game animals		Taxing of natural and legal persons using game animals promotes sustainable use of this part of biodiversity
Law on Environmental Pollution Tax (“Valstybes žinios”, 1991, Nr. 11-274; 2006, Nr. 65, - 2382) §5. 1) The tax will be reduced for a period up to 3 years to the natural and legal persons that implement the environment protection measures decreasing pollution from stationary sources not less than by 5% of the maximal allowed pollution rate.	Order of the Minister of the Environment how to estimate and pay the environmental pollution tax (“Valstybes žinios”, 2003, Nr. 4; 2003, Nr. 8; 2005, Nr. 3)	The basic goals of the Law are: to employ economic measures for encouraging polluters to mitigate pollution of the environment, to pursue waste prevention and management, not to exceed the limits imposed on waste, and to accumulate income for the implementation of environment protection measures. These measures promote the CSR.
Law on Territorial Planning (“Valstybes žinios”, 1995, Nr. 107-2391; 2004, Nr. 21-617) §3. The goals of territorial planning are as follows <...>: 4) to preserve, sustainably use and restore the natural resources, the natural and cultural values, including recreation resources; 5) to form the natural framework, to ensure the preconditions for preservation or restoration of the ecological equilibrium of the landscape; §17. The procedure of the special territory planning <...>: 4) Assessment of consequences of the territory planning document. In necessary cases, the strategic assessment of consequences to the environment shall be fulfilled. <...>		The law stimulates participation of stakeholders; their environmental consciousness is promoted through the involvement into public discussion on planning document.
Law on Protected Areas (“Valstybes žinios”, 1993, Nr. 63-1188; 2001, Nr. 108-3902) §32. The rights and duties of the land owners and users in the protected territories: 7. The persons living in the protected territory may have business that does not contravene the goals of the protected territory; they may receive funding and other support for the maintenance of the territorial complexes and objects (values). 8. In the protected territories, the land owners and users may get exemptions of land tax and other franchises <...>	Procedures on preparation and approval of strategic planning documents of protected areas, approved by the Government Resolution No 709 of 2004-06-09, “Valstybes žinios”, 2004, No 93-3409 Standard Regulations for Protection of Protected Areas, approved by the Government resolution No 996 of 2004-08-19, “Valstybes žinios”, 2004, No 131-4704	One of the goals of the Law on Protected Areas (Art. 21) is to create a natural framework at the country level that consists of protected territories and natural corridors between them, thus preserving the natural landscape and the natural recreational resources. The compensation mechanisms and tax exemptions
MANAGEMENT OF HAZARDOUS SUBSTANCES		
Law on Environment Protection (“Valstybes žinios”, 1992, Nr. 5–75; 2005, Nr. 47-1558)		The Law of Environment Protection determines the principle of the management of

<p>§20. Legal and natural persons dealing with hazardous chemical substances must follow the regulations of using, preservation, accounting, dumping, detoxification, transport, import and export. Such chemical substances are stored, dumped and detoxicated at the expense of the producer or the user.</p> <p>Law on the Control of Poisonous Substances ("Valstybes žinios", 2001, Nr. 64 - 2330)</p> <p>Law on chemical substances and preparations ("Valstybes žinios", 2000, Nr. 36- 987; 2006, Nr. 65-2381)</p>		<p>hazardous substances: "the polluter pays". The Laws on the Control of Poisonous Substances and on Chemical Substances and Preparations regulate the management of such substances, the rights and obligations of their producers and users.</p>
SAFE PRODUCTS		
<p>Law on Biofuel and Bio-oils ("Valstybes žinios", 2000, Nr. 64-1940; 2004, Nr. 28-870)</p> <p>Sets forth the legal conditions for the production, use and promotion of biofuel, biofuels for transport and bio-oils.</p>	<p>Programme of Promotion of Biofuel Production and Consumption 2004–2010 ("Valstybes žinios", 2004, Nr. 133-4786).</p> <p>Order of the Minister of the Agriculture on the regulation of support of biofuel production ("Valstybes žinios", 2007, Nr. 91-3667)</p>	<p>Production of biofuel is ascribed to new, environmentally friendly technologies. Manufacturers and users of biogases, biofuels and bio-oils are subject to statutory exemptions. By aiming to promote the use of biofuels, the Law on Pollution Tax of the Republic of Lithuania establishes that natural or legal persons polluting from transport vehicles using bio-fuel of established standards upon submitting the documents certifying the consumption of bio-fuel, as well as natural or legal persons who submit documents certifying the consumption of bio-fuel shall be exempted from the pollution tax for pollution from stationary sources of pollution for pollutants discharged into the atmosphere when using bio-fuel</p>
<p>Law on Value Added Tax ("Valstybes žinios", 2002, Nr. 35- 1271)</p> <p>§19. VAT tariffs: The standard VAT rate is 18%. In addition, reduced VAT rates (5% and 9%) are applied. Organically produced food products are taxed at the reduced 5% VAT rate.</p>		<p>Tax exemptions for the organic products stimulate the producers to apply the environmentally and biodiversity-friendly agricultural technologies.</p>
<p>The Program of Development of the Ecological (organic) Agriculture ("Valstybes žinios", 2002, Nr. 115-5177)</p> <p>The ecological agriculture is a farming without using the synthetic chemicals and genetically modified organisms, based on sustainable and environment-friendly agriculture principles.</p>		<p>The Ministry of Agriculture and the Ministry of Health have established the certifying institution, the public office "Ekoagros". It reimburses the investments and compensates the reduced income for the subjects of organic farming, promoting the latter.</p>
WASTE MANAGEMENT		
<p>Law on Waste Management ("Valstybes žinios", 1998, Nr. 61-1726; 2002, Nr. 72-3016).</p> <p>§3. The companies, which activities are accompanied with production of waste and those use, handle or otherwise manage waste, must tackle all available and economically justifiable measures to decrease its amount and noxious effects to the human health and to the environment.</p> <p>§32. "Polluter pays" principle: waste management expenses should be paid by waste keeper and (or) waste producer, including packaging waste</p> <p>Law on Radioactive Waste Management ("Valstybes žinios", 1999, Nr. 50-1600).</p> <p>Objectives of the law are to develop the radioactive waste management infrastructure based on modern technologies and provide for the set of practical</p>	<p>Approved National Strategic Waste Management Plan 2007-2013 ("Valstybes žinios", 2007, Nr. 122-5003)</p>	<p>The national strategy for 2007-2013 prioritises the prevention of waste formation, the recycling or other use of waste to decrease its disposal. These priorities oblige to seek to ensure the reduction of waste formation in the country and the processing or other use of the waste which could not be avoided so as to reduce the placing of waste in landfills to the least possible extent. The plan also contains measures enabling the control of compliance with waste management requirements and tasks. The listed laws stress the environment protection. The implementation of these objectives promotes the CSR.</p>

<p>actions that shall bring management of radioactive waste in Lithuania in compliance with radioactive waste management principles of the International Atomic Energy Agency (IAEA) and with good practices in force in European Union Member States.</p> <p>Law on Management of Packaging and Packaging Waste (“Valstybes žinios”, 2001, Nr. 85-2968)</p> <p>Producers and importers must take all the necessary measures to ensure that empty transport, grouped and sales packaging as well as its waste are managed in accordance with the priorities laid down in the law and that targets for collection, recycling and reuse of packaging and packaging waste set by the Government or an institution authorised by it are attained. Producers and importers, which do not meet these requirements, must pay a tax for pollution of the environment with product waste pursuant to the procedure established by the law.</p>		
ECONOMIC CATEGORIES		
<p>Law on public procurement of the Republic of Lithuania (actual version “Valstybes žinios”, 2007, Nr. 114-4630)</p> <p>§37. (2) Contracting authority shall refer in the contracts documents to the Community Eco-Management and Audit Scheme (EMAS) or to environmental management standards based on the relevant European or international standards certified by bodies conforming to Community law or the relevant European or international standards concerning certification</p>	<p>Methodology for public procurement of goods and services, approved on 2003-02-26 by the Order Nr. 1S-26 of the Head of the Procurement Office under the Government of the Republic of Lithuania (“Valstybes žinios”, 2003, Nr. 22-949; 2007, Nr. 17- 650)</p>	<p>As the public procurement procedure is based on the lowest costs criteria, there is no motivation for companies to invest into new environmentally-friendly innovative technologies and processes because such an investment leads to increase of costs of goods and providing services. (See also comments on Green Public Procurement).</p>
<p>National Green Procurement Implementation Programme 2007-2011</p> <p>Decree No. 804. (“Valstybes žinios”, 2007, Nr. 90-3573).</p> <p>§2. Green Public Procurement is the approach of Public Bodies integrating the environmental criteria and/or requirements into their procurement process, seeking outcomes and solutions that have low impact on the environment considering their whole lifecycle, thus encouraging the promoting and development of environmental technologies</p> <p>§25. Claims that prepared Annual Report on Green Public Procurement of Contracting authority should be presented to Public Procurement Office under the Government of the Republic of Lithuania</p> <p>§26. Public Procurement Office under the Government of the Republic of Lithuania is responsible for monitoring of Green Public Procurement according to requested annual reports from Contracting authorities.</p>	<p>Decree No. D1-697 of the Minister of Environment of the Republic of Lithuania (December 22, 2007): a list of products for which the environmental criteria in public procurement procedures should be applied since 2008 and approved the environmental criteria for such products.</p>	<p>According to the Programme, “green” procurement must reach the level of 10% of all public procurement till 2008, not less than 15% till 2009, not less than 20% till 2010 and finally not less than 25% till the end of 2011</p> <p>The Green Procurement website is not accessible for public yet.</p> <p>In the Programme, the following implementing organizations have been determined:</p> <ul style="list-style-type: none"> • Ministry of Environment, • Public Procurement Office under the Government of the Republic of Lithuania. <p>Thought the Programme is mentioned that information will be available on the Green Procurement website, it is not accessible for the public yet.</p>
<p>Approval of the Conception of the Establishment and Development of Integrated Science, Studies and Business Centres (Valleys)</p> <p>Nr. 321 (“Valstybes žinios”, 2007, Nr. 40-1489)</p> <p>§2. “Integrated Science, Studies and Business Centres (“Valleys”) which would facilitate in creating in Lithuania the science, studies and knowledge-economy clusters of an international level”.</p> <p>§4. “The Valleys will be financed from several sources: public investments, financial aid from the EU Structural Funds (2007–2013) in observance of</p>	<p>Practice Statement on the Selection and Evaluation of the Integrated Science, Studies and Business Centre (Valley) Visions and Draft Valley Development Programmes approved by Order Nr. I1118/4- 231 of the Minister of Education and Science of the Republic of Lithuania and the Minister of Economy of the Republic of</p>	<p>Help to improve the link between science and studies and business enterprises, development of R&D works linked with the “Valley” development trends, to create and implement innovations which might generate the greatest benefits for environment and the growth of business.</p>

the Rules for the Grant of Community Financial Aid for 2007–2013 of the Republic of Lithuania Ministry of Education and Science, Ministry of Economy, Ministry of Agriculture and other authorities. Other: private business partners, etc”.	Lithuania (“Valstybes žinios”, 2007, Nr. 64-2465)	
National Education Programme of Sustainable Development 2007-2015 , approved by Order Nr. 1062 of the Government the Republic of Lithuania (“Valstybes žinios”, 2007, Nr. 106-4348)	Provisions for the European Commission coordination and implementation of the National Education Programme of Sustainable Development 2007-2015 adopted by the Government of the Republic of Lithuania 2006-05-31 “Valstybes žinios”, 2006, Nr. 62- 2276)	The Programme refers the term of sustainable development as “compromise between economic, social and environmental demands of the society which creates the opportunities to attain overall welfare for the current and future generations, without overstepping the permissible environmental impact limits” It is not defined in the Programme, how private legal bodies will be involved in the programme implementation.
Law on Financial Statements of Companies (“Valstybes žinios”, 2001, Nr. 99-3516; 2007, Nr. 68-2655). §24-1. 1 p. involves the provisions concerning the providing information on environment, presented in the annual report of the companies.		Thought the providing information on environment is seen in the Law, it is becomes unclear how it will be presented.
INVESTMENT IN ENVIRONMENT PROTECTION		
Order Nr. 85-3890, 2003, of the Minister on Environment on the approval for the financing and monitoring of a public institution the Lithuanian Environmental Investment Fund (LEIF) (“Valstybes žinios”; 2005, Nr. 92-3435)	Order of the Minister of Environment on the approval for the financing and monitoring of a LEIF investment projects (“Valstybes žinios”, 2004, Nr. 143- 5237)	The main goal of the LEIF is to support public and private sectors in realization of environmental projects and projects to reduce the negative impact of economic activities on environment in compliance with the Environmental Strategy of the Republic of Lithuania. The Fund supports investment projects in the form of soft loans and subsidies. The extension of LEIF loans for financing investment projects is made through commercial banks, leasing companies, which can co-finance the projects as well as assume the risk for non-repayment of a loan.
ENVIRONMENTAL CERTIFICATION		
The Order of the Minister of Environment “On mandatory indicative guidelines for the fixing of costs and fees in connection with the Community Eco-labelling” (“Valstybes žinios”, 2002, Nr. 44 - 1683) states that applications and annual fees for Community Eco-labelling will be calculated according to the Commission Decision amending Decision 2000/728/EC establishing the application and annual fees of the Community eco-label (announced in the supply Informational reports, 2002.05.16, Nr.: 38		Eco-labels award and promote environmentally superior goods and services and offer information on their quality and performance with respect to consumer health, resource consumption, and environmental impacts. Promotion of the Eco-labelling by means of fiscal measures: annual fees and application payment are reduced by 25% for SMEs and developing food and service sector; annual fees are reduced by 15% for applicants that have EMAS or/and ISO 14001 certificate.
Order of the Minister of Agriculture on the approval for the Programme for the Organic Farming Development (“Valstybes žinios”, 2002, Nr. 115-5177) By using the organic agricultural and food products certification label the producer guarantees that its/his product is truly organic, leaving no room for doubt to the customer.		Organic farming certification helps: consumers to recognize and choose ecological products. This could contribute significantly to promotion of the CSR

Table 2.

Selected projects, aimed at promoting the environmental measures, with participation of the Lithuanian companies

Project Duration	Goals and objectives	Main results	Organizations involved Project website
Green procurement (December 2005 - September 2006)	To motivate authorities, business and NGOs to take up the green procurement idea and help them start to provide socially responsible services, save the resources, consider recycling and save the tax payers money		Baltijos Aplinkos Forumas http://www.bef.lt/en/pr_pramones_projektas.php?id=1167512760
Environmental protection in Metal industry (December 2005 - September 2006)	To build capacity and competence of Baltic stakeholders (SMEs operating in the supply chain of metal processing sector, associations and NGOs experts as the main target group) on implementation of environmental requirements and technologies	Several national and international meetings and international workshop will be arranged, analysis of environmental requirements and best environmental solutions, which will be followed by practical guidance for SMEs of metal industry supply chain, is foreseen. The project website, national info days will be organized	SMEs of metal industry supply chain Project donors: 2003 y. PHARE program "Cross Boarder cooperation in the Baltic Sea region " and Deutsche Bundesstiftung Umwelt. www.bef.lt/metalas
Innovation Relay Centre In Lithuania (IRC LITHUANIA) (4/1/2004 - 3/31/2008)	Providing advice on innovation management, strategic management, and marketing and specific technology issues	By delegation and financial support of its shareholder - the Ministry of Economy, Lithuanian Innovation Centre established its representative offices across all ten counties of Lithuania. The innovation support network will ensure good geographical coverage and be used to bring IRC services closer to the clients	Science and Technology Park Lietuvos inovacijų centras (Lithuanian Innovation Centre) http://cordis.europa.eu/fetch?CALLER=FP6_PROJ&ACTION=D&DOC=1049&CAT=PROJ&QUERY=1170700746449&RCN=73773
Organisation for the Promotion of Energy Technologies Lithuania (OPET LITHUANIA) 5/1/2000 - 4/30/2001	Assisting in the use, exploitation and dissemination of results from non-nuclear research, technological development and demonstration projects funded under the current Fifth Framework Programme in Lithuania. As member of OPET network OPET Lithuania will act in the context of ENERGIE work programme.	Offering the following key services: - assessing the real needs of market actors in order to encourage them to utilise clean and efficient energy technologies in their day-to-day business operations; - implementing targeted sets of results-oriented tasks which respond to real needs in the most cost-effective manner possible, and monitoring the impacts of those tasks using appropriate performance indicators: - taking action in order to replicate successes as widely and rapidly as possible.	LEI - Lithuanian Energy Institute http://cordis.europa.eu/fetch?CALLER=FP6_PROJ&ACTION=D&DOC=1049&CAT=PROJ&QUERY=1170700746449&RCN=73773
Regional Innovation Strategy for the South and East region of Lithuania RIS-LITHUANIA 6/1/2005 - 1/31/2008	To raise awareness and integrate innovation within the regional economic development strategies as a priority task	Contributing to the scientific, technical, wider societal and policy objectives of the Research and Innovation activity area: encouraging a more innovation-friendly environment, networking of players, stimulating technological innovation, setting up of innovative technology businesses and improving the cooperation and understanding between researchers, business, policy makers and society	Aristotle University of Thessaloniki - research committee - urban and regional innovation research unit; Lithuanian Business Employers' confederation'; Agency for international science and technology development; Latvian Technological Center; Kaunas University of Technology Regional Business Incubator; IMG innovations-management GMBH; Kaunas regional innovation centre http://cordis.europa.eu/fetch?CALLER=FP6_PROJ&ACTION=D&DOC=1052&CAT=PROJ&QUERY=1170700746449&RCN=75401
Sustainable industrial	To support development of theoretical and applied research	Increasing networking with and scientific support for different stakeholders in	Institute Of Environmental Engineering - Kaunas

development: capacity strengthening of the institute of environmental engineering (SID-APINI) 1/1/2003 - 6/30/2005	capacity of APINI in sustainable industrial development	implementing Water Policy Framework Directive, Integrated Pollution Prevention and Control Directive, Eco-Management and Audit Scheme, Integrated Product Policy; increased scope and quality of research, particularly application of modern systems theory to sustainable industrial development problems; increased regional coverage of the research activities in the Baltic Region.	University Of Technology http://cordis.europa.eu/data/PROJ_FP5/ACTIONeqDndSESSIONeq112242005919ndDOCeQ1957ndTBLeqEN_PROJ.htm
Economic and Technological Intelligence for SMEs in the field of packaging and associated branches (ETISPACK) 3/1/2001 - 8/31/2002)	To stimulate high quality SME participation in RTD participation programmes by providing an innovative and complete range of services performed by an international network.	8 workshops in the involved countries will provide information about recent scientific and technological innovations in the area of packaging. 213 Technology audits will be carried out to assist SMEs in the assessment of their technological needs and requirements and the definition of innovation plans.	The Foundation Packforsk-the Institute for Packaging and Distribution Novexrael http://cordis.europa.eu/data/PROJ_FP5/ACTIONeqDndSESSIONeq21722200595ndDOCeQ34ndTBLeqEN_PROJ.htm
The use of life cycle assessment tools for the development of integrated waste management strategies for cities and regions with rapid growing economies (LCA-IWM)	Practical tools will be developed to support (i) planning of new and (ii) optimisation of the existing waste management systems in the European cities. The targeted tools are: Waste generation prognostic model and Sustainability criteria and indicators for assessment/benchmarking of waste management scenarios	The developed tools will be then practically verified through application for waste management planning and/or optimisation in the selected cities from rapid growing European regions including Lithuania (Kaunas)	Kaunas University of Technology; Democritus University of Thrace; Darmstadt University of technology; University of agricultural sciences-Vienna; Slovak University of technology; Wroclaw University of technology; Institut fuer Wasserversorgung, Abwassertechnik, Abfalltechnik, Umwelt-raumplanung; Universitat rovira i virgili; Wameco s.c. Ryszard Szpadt, Szczepaniak Wlodzimierz; Infrastruktur & Umwelt, prof. Dr.-ing. Hans Reiner Boehm und partner http://cordis.europa.eu/data/PROJ_FP5/ACTIONeqDndSESSIONeq112362005919ndDOCeQ1855ndTBLeqEN_PROJ.htm
Enhancing Research and Development Projects to find Solutions to Struggle against various Marine Pollutions (MAPO) 9/1/2005 - 8/31/2007	Identification of best practices to facilitate the integration of European SMEs into current and future FP projects, the updating of the current state-of-the-art as well as the establishment of a European cartography of skills in the field of marine pollutions allowing a networking of competencies,	MAPO consortium gathers partners experienced in information and assistance to SMEs within Framework Programmes (like SME National Contact Points or management consultants), but also in environmental risks and marine pollutions (researchers and technical consultants).	Vilnius Gedimino Technikos Universitetas; Bfu büro für Umweltfragen gmbh; Ege universitesi; Innova s.p.a. L'association Du Technopole Brest Iroise; Universidad de oviedo; Ecotechnika; The Alliance of maritime regional interests in Europe; Hlp development; Degrand Olivier Jacques Carl Francois; Cliff Funnell Associates; Icelandic centre for Research; Safinah limited http://cordis.europa.eu/fetch?CAL_LER=FP6_PROJ&ACTION=D&DOC=1070&CAT=PROJ&QUERY=1170700746784&RCN=75116
Vilnius Heat Demand	To reduce the emissions of greenhouse gases from the	A commercially sustainable (revolving) financial facility will be created - ECP	Vilnius Energija, Vilnius Municipality

Management GEF Project (10-JUN-2003 - 31-DEC-2008)	Vilnius District Heating System	Commercial Fund - to support the implementation of investments aimed at reducing heat losses from the City's housing stock. The facility would provide both financing, and technical assistance for such investments, mobilizing additional financing from commercial sources as appropriate	
Klaipeda Port Project (11-MAY-2000 - 31-DEC-2008)	To strengthen the long term competitiveness of this Baltic region port, and, to improve environmental conditions, by preventing spills, improving waste reception facilities, and monitoring environmental conditions	Technical assistance will be provided, through studies to estimate the appropriate level of land lease rates, to avoid cross subsidies with harbour dues, and review lease management contracting, and procurement procedures, and, will focus on privatization practices for port services, and management	Ministry of Transport Port of Klaipeda

Table 3.

List of projects GEF SGP involving companies' contribution to biodiversity conservation in Lithuania (names of companies and enterprises involved are in bold)

Project Data	Goals, activities and results	Organisations included
Protection of the Endangered Forest Birds in Future Forest Felling Areas 2002 03 01 – 2003 12 09	To demonstrate how planning and performing of major forest felling works can preserve biodiversity of commercial forests including rare wild birds. To achieve this it was necessary to make the inventory of biodiversity in future forest felling places of Kedainiai Forest Enterprise , ensure its preservation and inform about measures applied. During the inventory 80 nesting places were found and conserved. A special event „Protecting birds – first protect trees” was organized for schoolchildren. Seminars of national level were organized for foresters. Methodical booklet „Major forest felling and bird protection in Lithuania” and other information brochures have been published. Recommendations for improvement of regulation of forest utilization have been prepared. Registration of areas important to rare wild birds has been carried out professionally in Kedainiai Forest Enterprise. During the inventory a large part of Lesser Spotted Eagles' and Black Storks population was found and conserved. Ministry of Environment as accepted recommendations prepared by the NGO on protection of wild birds	Lithuanian Ornithological Society. The project was co-financed by the Danish Ornithological Society and Kedainiai Forest Enterprise .
Reduction of Impact on Rare Seabirds in the Baltic Sea (Part I); Protection of Natura 2000 Areas at the Baltic Sea (Part II) 2001 11 22 – 2003 02 11 and 2003 02 13 – 2004 10.30	To improve the wintering conditions of the waterfowl on the Baltic seashore of Lithuania, and to reduce the conflict between the protection of waterfowls wintering on the Baltic seashore and the economic interests of local fishing community by legal means as well as to ensure cooperation with the seashore fishing community Close relations with the fishing community's people were established and environmental protection knowledge as been imparted to them. In cooperation with the Institute of Ecology of Vilnius University the increasing extinction of wintering birds in gillnets and the distribution of birds on the Baltic seashore have been studied in detail. On the basis of information collected recommendations were prepared proposing optimal restrictions on fishing, which would improve winter conditions of the birds to the maximum with the least economic loss for fishermen. Also, experiments have been carried out in modifying the gillnets with the hope that the loss of wintering birds will become much smaller. Five publications are published, a booklet is being prepared and information was disseminated in the mass media. In close cooperation with fishermen, one of the most exhaustive evaluations of birds caught in gillnets has been made not only in Lithuania but also within the entire Baltic Sea region. Monitoring schemes of wintering birds for marine Natura 2000 areas were made and the boundaries of wintering sites of the waterfowl that are of international importance have been adjusted, and regulations on the protection measures of rare marine waterfowls have been harmonized and approved by the MoE. If the proposed protection measures will be implemented, the total mortality rate of birds in gillnets will decrease by 35-50 percent.	Society of Ornithologists of Kaunas Region Institute of Ecology of Vilnius University Lithuanian Association of Fish Product Producers became the main donor of the Part II of the project
Protection of the Population of the White-tailed Eagle (<i>Haliaeetus albicilla</i>) in Klaipeda and	To conserve and increase the population of the globally endangered White-tailed Eagle (about 80 couples of the White-tailed Eagle breed in Lithuania) by involving the local communities in these activities, to increase the number of breeding couples, to establish a monitoring network and carry out monitoring, to raise awareness of the people in nature protection and nature management. 20 artificial nests will be installed in Klaipeda and in Vilnius counties. In winter season additionally 3,500kg of meat and fish will be fed to 30 birds in eight sites. 108 artificial and natural nests will be monitored, twenty young individuals will be marked and the database	Fund for the Development of Nature Protection Projects State Institute of Forest Management

Vilnius Counties 9/2004 - 3/2006	will be managed. For educational purposes and to increase the public participation in the environmental activities, community meetings will be held, 12 different events and seminars for specialists, foresters, and owners of private forests will be organized. A photography exhibition will be mounted for teachers and schoolchildren. Information leaflets will be published; expositions at Kaunas Zoo and Kaunas Zoo Museum will be prepared. Relevant information will be disseminated through the mass media. Employees of Kaunas Zoo took an active part in the project. Besides, cooperation with Trakai and Neringa municipalities is promoted. AS a result of the present project the population of the sea eagle is likely to increase by 20-30 per cent. Moreover, felling of woods should decrease by 10 percent, consequently danger to this species will also decrease. In cooperation with the State Institute of Forest Management nest sites will be legalized and marked in the forest management plans, which, in turn, will reduce the risk of felling of trees	Kaunas Zoo Kaunas Zoo Museum Trakai and Neringa municipalities Company Litagra has co-financed this project
Preservation of Relict Oak-wood of Dukstos and its Biodiversity for Future Generations 2003 06 01 – 2004 07 28	Is cooperation with the Vilnius Forest Enterprise so as to preserve relict Dukstos oak-wood (300 ha , 45 rare and endangered species: fat dormouse, species of bats, lichen and mushrooms found there) and its biodiversity, to include the site into the Natura 2000 network, to undertake concrete nature protection actions for increasing of abundance of endangered species populations, to involve local communities in the protection of the oak-wood, and to explain the importance of the biodiversity in the oak-wood to the tourists. Completed scientific research showed that the oakwood was much more valuable than expected. The following activities have been completed: 70 nesting-boxes for dormouse, 40 – for birds, 70 – for bats were put up, recommendations for the protection of bats and the dormouse, as well as recommendation prepared. The oak-wood was designated as Natura 2000 site. Vilnius Forest Enterprise started applying the principles of biodiversity preservation and implementing a programme for the restoration of the oak-wood. An Internet website was prepared and information materials were issued. This was the first time that a forest enterprise, a national NGO, a regional park, a scientific institute and a local community closely cooperated for the restoration of a unique ecosystem and the adaptation of it for tourism and education. A positive change of 50 per cent increase of species under extinction found in the oak-wood was noticed at the end of project implementation. A long-term impact has been ensured by including the oak-wood into Natura 2000 network and by involving forest enterprise in these activities. In the area of 214 ha felling of old oak trees was stopped	Environmental Information Centre Vilnius Forest Enterprise
Adaptation of Grybaulia Fish Ponds to Bird Protection and Ornithological Tourism 2003 02 01 – 2004 10 30	To increase the population of rare birds in the area of Grybaulia fishing ponds (neighbouring to the Cepkeliai State Nature Reserve), to improve conditions for breeding, feeding and roosting, and at the same time to create an infrastructure for ornithological tourism and to carry out educational activities. After convincing the owners of the company “ Kabeliu tvenkiniai ” for deriving mutual benefits, 200ha of neglected ponds were better adopted for birds breeding and needs. In the area of ponds and in the surrounding forests in order to improve bird breeding and hiding sites 310 nesting boxes, 45 artificial nests, 4 artificial islands and nesting places for waterfowl were constructed and placed. Educational seminars and training for the local people about the provisions and management of rural tourism services were organized, information material and a book were published, and a film was created. The grantees successfully cooperated with private business by convincing them to lose a part of their short-term profit and take care of the created tourism infrastructure as well as to orient their business towards the development of ornithological tourism. Conditions for 32 species of rare birds and 4 species of rare amphibians were improved, three couples of White-tailed Eagle have settled in the constructed artificial nests.	Biodiversity Information Centre Biota NGO Nature Heritage Fund and company “ Kabeliu tvenkiniai ” (“ Kabeliu ponds ”) co-financed the project
Conservation of Rusne Island in the Nemunas Delta 2003 11 06 – 2005 12 30	To increase the number of rare breeding birds by introducing beef stock-raising, and thus enabling the local farmers to derive profit and ensuring sustainable meadows management. Three different modes of nature management will be applied in the area of 56ha: haymaking and aftercrop grazing, only grazing and doing nothing. Three families will be given 16 cows of Hereford breed and in the future newly born animals will be shared with other farmers. Moreover, farmers introducing nature management measures will be able to apply for the state subsidies; they will also receive consultations on cattle care and other issues as well. This is the first project in the country when a community is encouraged to breed cattle for the nature management purpose. On a relatively small area covered by the project about 1 per cent of the country’s population of Redshanks, about 0.01 per cent of Cockerels and about 5 per cent of Godwits will be protected. It is planned that within a five-year period the beef cattle herds kept by the farmers will triple, hence, the positive impact on these bird species is likely to increase.	Lithuanian Fund for Nature Rusne Fund for Nature Local farmers
Strengthening Cooperation	To promote cooperation among ecological farms in Eastern Lithuania (famous for its lakes and biodiversity) for the joint production, processing marketing and sale of ecological products.	Ministry of Agriculture

among Ecological Farms in Eastern Lithuania “Gojelis” Community of Ecological Farms in Moletai Region 2003 11 01 – 2005 05 01	Strengthening knowledge of ecological farmers and developing technological basis of the organisation were of particular importance. The project’s grant funds have been used to set up three drying facilities for fruit, vegetables and medicinal herbs, a small bread bakery, milk production unit, a room for the production of pickles, and unit for packaging of ecological products were established. During the project, the membership in the “Gojelis” Community increased from 86 to 115, while 7 new members joined the “Padegsnys” cooperative. Promoting the development of cooperation among ecological farms, the leaders of the project will assist in establishing one more ecological farm cooperative near Joniškis. Cooperation and partnerships were developed with the Ministry of Agriculture and other SGP projects. The earnings from the project (10 per cent of the profits) will be used for raising an environmental fund that will help to selffund the environmental activities in the locality. After the project, Gojelis’ membership should grow to 150 and the Padegsnys Cooperative should have 40 members working in 680ha of farmland.	“Gojelis” Community
Establishment of an Agro-Environmental Training, Consultation and Information System in Lithuania 2004 06 30 – 2005 11 01	To develop a unified system of agro-environmental training, consultation and information in cooperation with the Ministry of Agriculture and research institutions, and to prepare a project for EU structural funds on the implementation of this system. On the basis of the Principles of Ecological Farming prepared by the SGP grantee and approved by the MoA, 600 people will be trained. After identifying additional training, consultation and information needs, special workshops will also be organized. Two methodological publications on agro-environmental measures will be issued and a 15-minute education video will be produced. About 20 consultants will be trained in the area of ecological farming to work in the regions. The development of a unified consultation, information and education system will allow qualified specialists to be trained for work in the regions and provide quality services affordable to ordinary rural people. The project is expected to increase the number of those engaged in ecological farming by 20-30 per cent, i.e., about 200 farms covering an area of some 6,400ha will be established	Ministry of Agriculture NGO “Gaja”, Ecological Farming Association of Lithuania

Table 4.

Conceptual framework applying in Lithuania (from “Baseline study on CSR practices in the new EU member states and candidate countries 2007”. United Nations Development Programme [http://www.acceleratingcsr.eu/uploads/docs/BASELINE_STUDY_ON\(summary\).pdf](http://www.acceleratingcsr.eu/uploads/docs/BASELINE_STUDY_ON(summary).pdf))

Summary of company responses: scores			
Legal and political environment	Civil society context	Reporting	Standards
C = attentive and emerging	D = Vigilant and challenged	D = Vigilant and challenged	D = Vigilant and challenged
Reasons for the scores			
As yet there are no formally identified CSR positions in the governmental structure and the government has not yet started to implement green procurement. Lithuania has published a Sustainable Development Strategy, which at the moment is being reviewed to include the CSR concept. The Ministry of Social Security and Labour (MSSL) has a number of positions that are partially responsible for CSR – it has an approved plan of measures to promote CSR for 2006-2008. The MSSL leads an inter-agency CSR Coordination Committee and Environmental Ministry which is responsible for reporting to the National Sustainable Development Commission on Sustainable Development Strategy implementation. These are the	Civil society in Lithuania is not strongly developed. The only CSO that currently organises any boycotts is the Lithuanian Green Movement, but it is resource constrained. NGOs are wholly reliant on financial support from the state and from companies. International organisations are still intensively working on spreading the idea of CSR; they are one of the most important promoters of CSR in the country. CSR is still not really on the agenda of universities and research institutes and there are only a few positive exceptions. The media has not yet found its own role in spreading CSR, CSR related issues appear only occasionally in the mainstream national media, however, the media covers boycotts (e.g. against GMOs) and independent media have started to tackle various CSR-related issues. Systematic stakeholder dialogue with companies does not yet exist in Lithuania in an organised way.	Of all the companies in Lithuania only the telecommunication company Teo has published separate CSR Reports in 2006-2007, but some include non-financial information in their annual reports	More than 2 200 companies are independently certified to the ISO 14001 standard – but less than 20% of the companies in Lithuania. So far 45 national companies have signed the Global Compact. The adoption of these initiatives by second tier companies is not known.

main strengths of Lithuania in the domain of the legal and political environment			
Recommendations provided:			
For the state		For the civil society	For business
(1) Make CSR relevant to education (integration of the CSR - related courses into high-education curricula, support for the development of academic interest in the subject). (2) Provide a well targeted support to encourage CSR (develop the grant schemes designed to encourage CSOs to get involved in CSR). (3) Make green procurement a reality (develop the necessary administrative capacities and amend regulations so that to increase the proportion of the green public procurement).	(4) Improve co-ordination of the CSR-related state policies (include CSR explicitly into the relevant strategic documents, build administrative capacities for coordination, assign necessary responsibilities, encourage inter-institutional co-ordination mechanisms). (5) Municipalities: get involved with CSR (encourage the municipalities to engage in CSR support cooperation between municipalities, good practice exchange at the national and international level).	(1) Engage into co-ordinated action (e.g., round tables, meetings on a regular basis, web-sites to discuss, to coordinate actions and to put a pressure both on the state and on the companies). 2) Make CSR visible (e.g. rankings, awards and publicity campaigns). (3) Increase national CSR expertise and leadership (e.g. training, research and expert networks to develop national expertise on the CSR issues).	(1) Involve associations (associations as the drivers of CSR , promoting concrete tools for the specific sectors and processes, encouraging exchange of good practices). (2) Exchange of experience (events, forums and networks, aimed at exchange and dissemination of good practices; strengthening of the UN Global Compact). (3) Approach CSR as a business opportunity (support for and encouragement of development of the CSR consultancy and assurance services).
Companies scored			
<ul style="list-style-type: none"> • Achema • Anyksciu kvarcas • Arijus • Autotoja • Bonum Publicum • Constructus • Danisco Sugar • Deva • DnB Nord • Durpeta 	<ul style="list-style-type: none"> • Fermentas • Hansabankas • Kauno autobusai • Kauno regiono keliai • Kraft Foods Lietuva • Klaipedos energija • Lietuvos pastas • Lifosa • Maxima LT • Meta 	<ul style="list-style-type: none"> • Narbutas ir Ko • Omnitel • Pakmarkas • Rimi Lietuva • Rizgonys • Ruta • Samsonas • Sanga • Schneider Electric Lietuva • Šiauliai bankas 	<ul style="list-style-type: none"> • Šiauliai energija • Šiauliai vandenys • Singlis • Teo • Utenos trikotazas • Vilniaus autobusai • Vilniaus miskų ūdija • Vilniaus Vandeny • Yazaki Wiring
All scores: A = Integrated and managed B = Aware and responsive C = Attentive and emerging D = Vigilant and challenged E = Unaware and distracted			

Table 5.

Members of the Global Compact Lithuania www.globalcompact.lt

According to the Ministry of Social Security and Labour (14 02 2007) <http://www.socmin.lt/index.php?1677521490>

Enterprises	
1	Concern "Achema group" (Koncernas „Achemos grupe“) http://www.achema.com/index.php?lng=en&content=pages&page_id=284
2	Company "AGA" (Bendrove „AGA“) http://www.finhill.lt/contacts/
3	Company "ALNA" (AB „ALNA“) http://www.alna.com/about_alna/beyond_business/
4	Trading company "Apranga" (Akcine prekybos bendrove „Apranga“) http://www.apranga.lt/investuotojams/index.php/site_structure/contacts_and_ordering_of_information/108
5	Company "Baltu zemes" (UAB „Baltu žemes“) http://www.naujinamai.lt/baltuzemes-en/index.php?language_id=en&action=view&directory_id=203
6	Company „Berlin-Chemie Menarini Baltic“ (UAB „Berlin-Chemie Menarini Baltic“ http://www.berlin-chemie.lt/english/index.html
7	Company "Bureau Veritas Lit." (UAB „Bureau Veritas Lit.“) http://www.bureauveritas.lt

8	Joint stock limited life insurance and pension company „Aviva Lithuania“ (Uždaroji akcine gyvybes draudimo ir pensiju bendrove „Aviva Lietuva) http://www.aviva.lt/lt/atsakomybe/vykdomi_projektai.php
9	Company “Constructus” (UAB „Constructus“) http://www.constructus.lt/environment/
10	Company “Danisco Sugar Kedainiai“ (UAB „Danisco Sugar Kedainiai“) www.danisco.com
11	Company “Danisco Sugar Panevezys“ (UAB „Danisco Sugar Panevezys“) www.danisco.com
12	Company “Economic consultations and research” (UAB „Ekonomines konsultacijos ir tyrimai“) http://www.ekt.lt/en/main/apie_mus
13	Company “EkspONENTE” (UAB „EkspONENTE“) http://www.eksponente.lt/en/projektai.html
14	Company „Ericsson Lietuva“ (UAB „Ericsson Lietuva“) http://www.ericsson.com/lt/
15	Company „Ernst&Young“ (UAB „Ernst&Young“) http://www.ey.com/GLOBAL/content.nsf/Lithuania_E/Lithuania_Home
16	Company “EURA” (UAB „EURA“) http://www.eura.lt/?language=en&action=viewGroup&group_id=73
17	Bank “Hansabankas” (AB „Hansabankas“) http://www.swedbank.lt/en/pages/private
18	Company “Life Insurance Bonum Publicum” (UAB „Gyvybes draudimas Bonum Publicum“) http://www.bonumpublicum.lt/page.asp?DL=E&TopicID=1
19	Company „Invalida Service“ (UAB „Invalida Service“) http://www.inservice.lt/en.php/services/facilities_management/33
20	Company “Klaipedos cardboard” (AB „Klaipedos kartonas“) http://www.kartonas.lt/bendrove/aplinka/aplinkapsaug/
21	Lawyer company „Lideika, Petrauskas, Valiunas ir partneriai LAWIN“ Advokatu kontora „Lideika, Petrauskas, Valiunas ir partneriai LAWIN“) http://www.lawin.lt/en/docs.UlistS
22	Company “Statoil Lithuania” (UAB „Lietuva Statoil“) http://www.statoil.lt/
23	Company “TEO” (AB „TEO“) http://www.teo.lt/en
24	Company “Lifosa” (AB „Lifosa“) www.lifosa.com
25	Company “Mazeikiu oil” (AB „Mazeikiu nafta“) http://www.nafta.lt/en/content.php?pid=10
26	Bank “Medicinos bankas” (AB „Medicinos bankas“) http://www.medbank.lt/en/apie/
27	Concern “MG Baltic” (Koncernas „MG Baltic“) http://www.mgbaltic.lt/en.php/society_and_us/environment_protection/226
28	Company “Narbutas ir Ko” (UAB „Narbutas ir Ko“) http://www.narbutas.com/index.php?cid=12322
29	Company “Nestle Baltics” (UAB „Nestle Baltics“)
30	Company “Pakmarkas” (UAB „Pakmarkas“) http://www.pakmarkas.lt/index.php/en/34258/
31	Company “Pas Dobilas” (UAB „Pas dobilas“)
32	Bank “SEB Vilnius bankas” (AB „SEB Vilniaus bankas“) http://www.seb.lt/lt/wcp/
33	Bank “Bankas Snoras” (AB „Snoras“) http://www.snoras.com/lt
34	Company „Švyturys-Utenos alus“ (UAB „Švyturys-Utenos alus“) http://www.svyturys.lt/lt/main/info/production/bendra
35	Company “Traidenis” (UAB „Traidenis“) http://www.traidenis.lt/index.php/en/
36	Company “Utenos trikotažas” (AB „Utenos trikotažas“ www.utenostrikotazas.lt
37	Bank “Ukio bankas” (AB „Ukio bankas“) http://www.ub.lt/index.aspx?PageLang=ENG&PageFontSize=
38	Company “Valpirus” (UAB „Valpirus“)
Organizations	
39	„Baltic Management Institute“ („Baltijos vadybos institutas“) http://www.bmi.lt/
40	Association „Investors Forum“ (Asociacija „Investuotoju forumas“) http://www.investorsforum.lt/index.php
41	“Engineering Ecology Association” („Inžinerines ekologijos asociacija“) http://www.iea.lt/
42	„Association of Young Managers“ („Jaunuju vadovu asociacija“) http://www.jva.lt/lt/veikla
43	„Union of Lithuanian Food Producers“ („Lietuvos maistininku profesine sajunga“) http://maistprofsajunga.lt/index.php?option=com_frontpage&Itemid=1
44	“National Association of the Electrical Engineering Business” („Nacionaline elektros technikos verslo asociacija) http://www.neta.lt/en.php

45 “Centre of Training for Energy Specialists” („Respublikinis energetiku mokymo centras”
<http://www.remc.lt/en/home.php>

Table 6.

The list of summaries of the research activities related to the industrial impact assessment in Lithuania.

Field	Summary
Cleaner Production (CP) promotion	<p>Cleaner Production should be an essential part of any comprehensive environmental management system at an enterprise or national level. In many cases the adoption of CP improvements can reduce or even eliminate the need for end-of-pipe investments and therefore can have both environmental and economic benefits. APINI is the main provider of CP services for the companies, governmental and financial institutions in Lithuania. In terms of CP investment financing, APINI plays a crucial role in CP project identification, evaluation, implementation and reporting. APINI co-ordinated most of the programmes/ projects supported by foreign donors related to sustainable consumption and production in Lithuania. In 1998 – 2008, Nordic Environment Finance Corporation (NEFCO) approved loans for more than 140 projects in more than 60 Lithuanian companies. The key objective of demonstration projects was to show the potential of CP concept in pilot enterprises and subsequently to introduce the concept to a broader number of enterprises. The application of a new innovative methodology for EMS enables reduction of EMS documentation in companies and makes EMS more attractive and more applicable for SMEs (Staniškis and Stasiškiene, 2003a; Staniškis, et al. 2008)</p> <p>M.Sc. programme in the area of environmental management and Cleaner Production was introduced in 2002. Students are provided with: (i) skills to identify and assess the effects of human activity on the environment; (ii) knowledge of national and international environmental policy and legislation and the management of environmental issues in industrial and service systems; (iii) knowledge of technical systems, strategies and technologies for applying the principles of cleaner production in developing products and production systems; and (iv) practical experience in implementing preventive environmental measures (Staniškis and Arbaciauskas 2003).</p>
Eco-Design	<p>The investigation of applying eco-design in Lithuanian industry has been carried out by APINI experts in the framework of the project “Transfer of Knowledge in the Field of Eco-design”. The main objectives of the study were to make analysis of eco-design situation in Lithuania to create dynamic model for systematic use of different tools for the environmental product development and to apply this model to the process of creation of new products in Lithuanian industry. Since 1993, significant progress has been made towards more sustainable consumption and production practices, particularly in terms of increased production process efficiency, reduction in resource consumption and waste/ pollution generation (Staniškis, et al. 2008)</p> <p>An integrated model for systematic use of different environmental improvement methods for development of new products has been developed taking into account main drivers for Eco-design in electronic equipment (EEE) industry. The results of the electricity meter Eco-design project are presented to demonstrate the effectiveness of the developed methodology (Gurauskiene and Varžinskas 2006)</p> <p>The eco-design methodology for development of vapour compression refrigeration system improvement is proposed. Refrigeration systems, as energy using products have a negative impact on the environment: emissions to air (including greenhouse gases), soil, water, and, generally, energy consumption. Reduction of energy consumption in product use is a very important issue because of the reduction of environmental impact and reduction of costs of electricity. The way how the global problems related to refrigeration systems could be solved using the model of systematic environmental product development is demonstrated (Gurauskiene and Pupinyte 2007).</p>
Eco-tourism Development	<p>Researchers of the Institute of Geology and Geography have carried out a pioneer study of eco-tourism development in Lithuania. The research was carried out by the order of the State Tourism Department. This is one of the first attempts to assess the possibility of eco-tourism development in Lithuania. The distribution of various forms of nature tourism, which have close similarities with eco-tourism, were analysed. The best possibilities to develop eco-tourism have been found in the territories that at present are used most intensively for nature tourism. On the other hand, from the point of view of sustainable development of the whole country, special attention should be paid to the territories that are used less intensively at present. The study has shown that almost all regions of Lithuania are promising for the development of eco-tourism. Most serious problems of eco-tourism development are related to the lack of effective marketing and purposive information as well as the lack of experience (Burneika and Kriauciunas 2007).</p> <p>Theoretical conception of sustainable development and different points of view to it is analyzed. Principles of sustainable development, forms of sustainability are discussed. Sustainable concept’s influence on tourism is analyzed. Sustainable tourism is discussed as region’s opportunity to create infrastructure of tourism where natural resources would be kept and market, similar to competition in tourism market, would be created at the same time. Sustainable tourism concept and principles, that highlight peculiarities of sustainable tourism conception as compared to general sustainable conception, are presented and applied to the case of Lithuania. When subtleties of the conception of sustainable development and the principles of development are overviewed and analyzed and the effectiveness of strategies of tourism of other countries</p>

	<p>are evaluated, Lithuania can be offered to apply the cooperated strategy of sustainable tourism, which would control and reserve today's natural, historical, cultural potentials in the country and to use superiorities over other countries. Only in this way Lithuania can be unique to itself and tourists from other countries; however a lot of attention should be paid to the problematic principles of sustainable development (Grundey. 2008; 2008 et al. 2008).</p>
Energy Efficiency	<p>Energy efficiency development in Lithuania since 1990 and the main legal, fiscal and financial and institutional measures implemented in Lithuania aiming to promote energy efficiency improvements are analyzed. Energy intensity currently in Lithuania is almost 1.2 times higher than in EU-15 average but the trends are positive and energy intensity has declined by 2.25 times during the investigated period (Štreimikiene et al. 2008a)</p> <p>A limited number of instruments aiming to promote implementation of energy efficiency measures and projects are applied in Lithuania. The main instruments are included in the National Energy Efficiency programme. A few applied fiscal and financial mechanisms for energy efficiency promotion are: value added tax (VAT) allowance, a special energy pricing scheme and fixed prices for electricity purchase from combined heat and power (CHP), soft loans and grants from Lithuanian Environmental Investment Fund, structural funds. Implementation of the measures foreseen in the National Energy Efficiency Programmes on the increase in energy prices and implementation of the EU Directives targeting at an energy efficiency increase are the main drivers of energy intensity decrease in Lithuania. Cleaner production activities are taking place in industries having an impact on the end-use energy efficiency increase in Lithuanian industry, they are: environmental management systems working in accordance to international standard ISO 14001: cleaner production, environmental performance evaluation, and environmental reporting based on a set of selected environmental performance indicators, etc. Implementation of the European Union Emission Trading Scheme (EU ETS) and Flexible Kyoto Mechanisms (Joint Implementation) in Lithuania stimulates realization of energy efficiency measures. A white certificate system has not been introduced in Lithuania yet. At present, however, the incentives provided by the Kyoto mechanisms, including the possible use of the EU ETS credits generated through JI or Clean Development (CDM) project activities are not sufficient to support energy efficiency projects in Lithuania because for the small scale energy efficiency projects the transaction costs are too high to apply JI. Implementation of white certificates trading would help promote energy efficiency projects in the most efficient way (Štreimikiene 2008; Štreimikiene et al. 2007a).</p> <p>During the pilot refurbishment FP-6 project Brita in PuBs, conceptual sustainable public buildings refurbishment model has been developed. Model was created basing on sustainable development principles, their consideration in decision making process and model efficiency influencing factors (Mickaityte et al. 2008).</p>
Engineering Economic	<p>A key element of competitiveness in the knowledge-based economy is to create linkages among academic society, research institutions, private sector and government. R&D (research and development) infrastructure involves mentioned subjects and could be interpreted as the main instrument of National Innovation System (NIS) Scientific researches theoretically attempt to describe the conception of R&D and innovation system. The practical findings were based on SWOT (strengths, weaknesses; opportunities and threats) analysis of Lithuanian R&D infrastructure. The essential threats of Lithuanian National Innovation System were named: linear funding model which is strongly bureaucratically controlled; shortage of horizontal interplay between governmental sectors which directly use R&D, miss of precise R&D funding mechanism; too conservative approach to innovations creation and application. (Daugeliene 2008)</p> <p>Detailed overview of possibilities to use the EU Structural Funds available for new member states (NMS) to finance sustainable energy projects and to overcome market failures related with negative externalities of pollution, positive externalities of knowledge and adoption of new pollution reduction technologies and incomplete information is presented. The analysis of current situation of the use of EU Structural funds (SF) for the implementation of sustainable energy projects in Lithuania was performed based on RUSE project results (Štreimikiene et. al. 2007b).</p> <p>The case study estimates the environmental-financial aspects of cogeneration system to be implemented at the boiler house. The analyzed quantitative assessment of national cogenerated energy potential serves as a tool for implementation of sustainable energy production in practice (Kliucininkas et al.2005).</p>
Environmental Consulting	<p>The possible impact of EU financial instruments on environmental consulting business in Lithuania is evaluated. The perspectives of environmental consulting business as well as approaches of environmental engineering business management from the viewpoint of principles of strategic management and environmental management systems are reviewed. (Abromavicius and Ciegis 2005)</p>
Environmental Policy	<p>Some theoretical developments and empirical studies dealing with an environmental Kuznets curve (the environmental Kuznets curves hypothesis is intended to represent a long-term relationship between environmental impact and economic growth) phenomenon and its use in environmental policy are reviewed. The environmental Kuznets curves analysis allows to clarify the main basic conditions for sustainable development management and assesses environmental policies aiming at sustainable development. (Ciegis, et al. 2007b)</p> <p>Production and use of energy is the main source of greenhouse gas (GHG) emissions in developed countries. In the Baltic States, climate change mitigation policies and measures implemented have been driven mainly by efforts to reach EU accession standards, and all EU environmental directives relating to the energy sector have now been implemented. A comparative review of the general framework for climate change mitigation in the energy sector of the Baltic States compares and analyses measures already implemented in the three countries — legal, fiscal and voluntary — and market based tools to reduce GHG emissions, and evaluates the impact of EU environmental and energy directives on the</p>

	reduction of GHG emissions (Štreimikiene et al. 2006).
Hazardous materials management	<p>In recent years on Lithuanian roads a considerable amount of hazardous materials have been transported, especially oil products. However, there is no common methodology which could assess the risk of such transportation. The Markov process is applied to describe a hazard distribution mechanism and to determine a limited hazard distribution in the nodes of networks (Augutis et al. 2007).</p> <p>The main elements of chemical risk management in enterprises and review of the state of chemical risk management in enterprises in Lithuania during the transitional period are presented (Kruopiene 2003).</p> <p>The research has proved that using the mixture of fir bark and wood in chips for the biological air treatment, the charge cleaning efficiency increases significantly and at the same time the durability of the biocharge is extended (Baltrenas and Zagorskis 2007).</p> <p>Adsorption air treatment equipment loaded with carbonaceous fibres was created for Volatile Organic Compounds (VOC) removal from the air. The experimental research shows that these materials are very effective (VOC removal from air efficiency reaches 90 percent) (Paliulis and Baltrenas 2007).</p> <p>The analysis of the use of flexible mechanisms under the Kyoto protocol in Baltic States and investigation of the perspectives of these tools in the future are carried out. The experience of Testing Ground Facility in Baltic Sea Region is presented and recommendations for the enhancement of joint implementation (JI) in Baltic States are developed based on analysis conducted. (Štreimikiene and Mikalauskiene 2005).</p> <p>The database “The implementation of Cleaner Production in Lithuania” was created and used for development of cleaner production technologies. The implementation of waste energy utilization techniques increases the companies’ level of environmental performance in such environmental sectors as energy, water and waste water, air pollution, incl. reduction of CO₂ emissions, etc. (Staniškis and Stasiškiene 2005; Kliopova and Staniškis 2006b; Dvarioniene and Stasiškiene 2007).</p> <p>The constantly growing amount of unutilised wastewater sewage sludge (SS) remains an unsolved environmental problem in Lithuania. SS can serve efficiently as a renewable feedstock in agriculture for the production of composts, for recultivation of exhausted lands and for woodland soil improvement in forestry. Unfortunately, SS application in agriculture is restricted by its contamination with pathogenic microorganisms, organic micro-pollutants and heavy metals (HM). The sewage sludge leaching in the environmental conditions and its alkaline stabilization by using an inorganic waste material – cement kiln dust – is investigated. Storage of the sewage sludge in special sites has a positive impact not only on the destruction of pathogens and micro-organic contaminants, but also on the reduction of heavy metal contamination; however, safe utilization of sludge landfilling leachate should be foreseen. Furthermore, such alkaline waste material as cement kiln dust can be successfully applied for wastewater sewage sludge stabilization (Paulauskas et al. 2006).</p>
Land Use Planning	<p>A concept of sustainable development is a critical key for regional planning in Lithuania. The structure of the concept includes determination of problem areas, formation of integrated spatial framework with localised functional priorities and regional regimes and organisation of spatial regional policy. The main spatial axes – urban and nature frames, as well as recreation or conservation belts are the integrated components of sustainable spatial structure of a region. Regional policy making could be organised by constructive, conservative and temperate scenarios, what is the prerogative of regional officials (Kavaliauskas 2008)</p> <p>The main factors that caused landscape changes in the Dovine river basin as well as in other rural areas of Lithuania in 1990–2003 were the restitution of private land property and the poor social, demographic and economic situation. Restitution of private land property and liquidation of collective farms (“kolkhozes”) increased land cover fragmentation and landscape diversity. The domination of small farms, lack of support and the poor social, demographic and economic situation determined deintensification of agriculture and such typical land use changes as expansion of grasslands, decrease of cultivated land as well as abandonment and afforestation of agricultural land. After 2003; the EU agri-environmental schemes have become the most significant driving forces. Afforestation of valuable agricultural habitats, eutrophication of water bodies, transformation of former collective farms and technical infrastructure are significant environmental and landscape management problems closely related with landscape changes. Although EU support is very helpful for rural development in Lithuania, the applied measures of Rural Development Programme are not effective enough in terms of landscape management, mainly due to unpreparedness of authorities and land owners as well as the lack of a clear landscape policy. There are three possible ways of the further development of peripheral rural landscapes in Lithuania, depending on natural conditions: (1) formation of homogeneous high-productive agricultural landscapes in fertile plains, (2) development of recreational landscapes in areas with a high recreational potential and (3) marginalisation of agricultural land (including afforestation and abandonment) in less favourable areas, conserving some structures and elements of traditional mosaic landscapes of extensive use which are especially valuable for biodiversity. (Pileckas and Gulbinas 2007).</p>
Management in Industries	Wood, furniture and paper products industry is one of the fastest growing and most promising manufacturing industries in Lithuania. The integrated Sustainability Balanced Scorecard (SBSC) and environmental management accounting (EMA) methodology for Lithuanian furniture companies makes it possible to measure the manufacturing performance of an enterprise and to get information for decision-making of what must be improved in environmental protection and where

the potential of savings lies (Laurinkeviciute, et al. 2008).

There is substantial evidence that when business can identify and allocate the environmental costs of production, they take action to reduce those costs. Experience, related with Cleaner Production investment project development and implementation, has shown that an increased awareness of environmental responsibility and policy contributes a great deal towards quality performance and positive corporate culture). Environmental accounting will be one of the most effective instruments to support the implementation of environmental management system (EMS), preparation of corporate environmental reports, assessing the gains of ecolabelling and development of environmental Indicators (Stasiškiene 2001).

The industry of quite high level was developed in Lithuania at the end of centralised economics period. The level decreased as Lithuania achieved independence. Increase of environmental quality was one of the side effects. It is better to achieve the increase of environmental quality establishing Sustainable Development principles. Several institutions try to influence establishment of Sustainable Development in Lithuania. These institutions (and not only them) need information about environmental management in enterprises as means to achieve several goals. Business Environmental Barometer is one of the ways to gather, analyse, and render information. The BEB is a multinational survey, which is carried out bi-annually. It was investigated at the beginning of 1993. Its idea is to analyse and compare the status of environmental management across countries over time. This method is based on sequence and consistency analyse of environmental management preconditions, means, and results (Cepinskis et al. 2001).

With the help of MATLAB 7.0 new modification of Monte Carlo algorithm aimed at fast and effective calculation of financial organization's Value at Risk by the example of Parex Bank's FOREX exposure was introduced (Smaliukiene 2007).

The priorities of the EU sustainable development strategy and a methodological framework for monitoring the implementation of the EU sustainable development targets relevant to the energy sector are presented. These targets are interrelated and can be addressed using a framework connecting the indicators with policies and measures aiming to achieve specific targets established by indicators and to show the interlinkages among the specific indicators and the interaction between policies and measures targeting specific indicators. The energy sector is a specific scope of sustainable development issues and is integrated in almost all priority areas of the EU sustainable development strategy: climate change mitigation and clean energy, sustainable transport, sustainable consumption and sustainable production, conservation and management of natural resources, public health, poverty and other social problems (Štreimikiene and Ciegis. 2007).

Renewable energy	<p>The country faces the problem of the change of the power generation structure with the main emphasis on the local and renewable energy (development of biomass (wood, chips, wood waste, straw, biogas) and small hydro projects and their subsequent implementation). The electricity from wood waste is produced by company "Pajurio mediena" in Klaipeda (installed capacity 1.5MW) and in CHP plant "Vilniaus Energija" in Vilnius (installed capacity 12 MW). The annual production of all biomass plants in Lithuania is 4.64GWh. There are 4 biogas cogeneration power plants in Lithuania. They are: 600 kW el. / 900 kW heat in company "Lekeciai" in Kaunas region, 275 kW el. / 600 kW heat in Waste Water Treatment Plant in Utena, 750kW el. / 1500 kW heat in Waste Water Treatment Plant in Kaunas and 2 units of 312kW el. / 316kW heat in JSC "Rokiškio suris" in Rokiškis (Katinas et al. 2007).</p> <p>The present renewable energy situation and assessed potential of renewable energy sources in Lithuania is reviewed. The anticipated closure of Ignalina NPP in 2010 will decrease the diversification of fuel supply and there is no huge potential for renewable energy use in Lithuania. Only biofuel, hydro and wind power can be considered as potential renewable energy sources in Lithuania (Štreimikiene et al. 2005).</p> <p>Lithuania possesses just fiscal and financial tools to promote the use of renewable energy sources and energy efficiency measures. The main recommendation is to start preparing for the implementation of the EU-wide integrated TGC ("Tradable Green Certificate") and TWC ("Tradable White Certificate") schemes by developing and implementing them in Lithuania for acquiring the experience as Estonia already did (Štreimikiene and Mikalauskiene 2007).</p> <p>Some of the results from the application of the Energy Indicators for Sustainable Development (EISD) tool for analysing trends, setting energy policy goals and monitoring progress towards these goals for Baltic States are summarised. A summary of the analysis of six priority areas defined by EU accession requirements for new Member States and provides recommendations for sustainable energy policy development in Baltic States and in Lithuania using this indicator approach is presented (Ciegis and Štreimikiene 2004; Štreimikiene 2005; Štreimikiene 2007; Ciegis et al. 2007a).</p> <p>The possibilities of increasing the use of wood from private forests in Lithuania for bioenergy purposes are examined The lack of specific policies supporting the use of natural resources is causing a lack of incentive to increase the use of local fuels. More information and research on the private forest sector is required for planning and developing biofuel use (Mizaraitė et al 2007).</p>
Sustainable Agriculture	<p>To protect water quality in its karst region, Lithuania has introduced a set of restrictions on farming practices. These restrictions were developed by a small technocratic elite and follow a 'narrow and deep' zonal management approach. Regulations are enforced by state agencies that have some degree of continuity in personnel at the local level from the late Soviet period but effective implementation and monitoring has been made more difficult by the land reform process. The latter has drastically increased the number of farms and created an extremely diverse set of actors in rural areas with</p>

Sustainable Business	<p>contrasting farm sizes, degrees of specialisation and levels of education. In an attempt to move beyond a reliance solely on a command approach, one policy entrepreneur has attempted to stimulate organic farming in the karst zone, turning use restrictions into a 'marketing asset'. Europeanisation of water policy has necessitated a move beyond 'narrow and deep' zonal management particularly with regard to the implementation of the Nitrates Directive. Implementation of the directive has revolved around a bilateral debate between the EC and a small number of key officials and experts in Lithuania who have drawn heavily on expertise from Scandinavian countries. Lithuanian officials have faced a problem of being unable to distinguish nitrate pollution caused by agriculture from other sources and this has contributed to a decision to designate the whole country as a nitrate-sensitive zone (Zemeckis et al. 2005).</p> <p>The EIA system applications in Lithuania has been investigated and its effectiveness has been evaluated. It is considered that EU requirements were successfully transposed into the legal system of the country, and currently environmental impact assessment of projects is regulated in the country good enough. Main shortcomings of EIA process in Lithuania are: subjectivity in forecasting environmental effects; insufficient consideration of alternatives, politization of the process and low competence of authorities involved (Kruopiene et al. 2008).</p> <p>On the base of the collected theoretical material the environmental engineering business development, approaches to the environmental engineering business management from the viewpoint of sustainability principles and the systems of sustainable business management are analyzed (Ciegis and Abromavicius 2004).</p> <p>Environmentally friendly management systems not only ensure an effective environment safeguarding, but also help the companies find new possibilities in business and avoid risk. Ecologically acceptable industry agrees well with nowadays' economic requirements: to use resources economically, develop manufacturing without waste, reject ecologically risky technologies, to give the green light to modern ecologically safe technologies. The Natural Step (TNS) framework helps economy and companies to adjust the conception of sustainable development more efficiently (Ciegis and Grunda 2006).</p> <p>Although Lithuania has enough resources for innovations, the interaction between universities and businesses is a casual and uncontrolled process. Lithuania's economy is based on SMEs. SMEs do not have such favourable possibilities to use knowledge as large international companies do. In this connection, the role of Science Park is undoubtedly positive. Science and Technology Parks are: Vilnius (North Town Technology Park, Science and Technology Park, Visoriai IT Park), Kaunas High and Information Technology Park, Klaipeda Science and Technology Park, Šiauliai University ST Park. However, Lithuania's incubators, science parks, and open laboratories are in the developmental stage. The main problems in the Lithuanian innovation sphere are: there is no overall managerial system of innovation activity, the mechanism of promotion of innovation development is not effective enough (Morkvenas 2006)</p> <p>The Institute of Environmental Engineering (EU Centre of Excellence in Sustainable Industrial Development (APINI – SID)) in 1992–2003 has been involved in introduction and implementation of preventive environmental strategy in industry in Lithuania and in other countries. In Lithuania, these efforts resulted in the implementation of more than 200 cleaner production innovations in more than 150 Lithuanian companies. Application of environmental management accounting (EMA), which integrates two of the main principles of sustainable development – environment and economics, can help to significantly improve corporate decision-making (Staniškis and Stasiškienė 2006a).</p> <p>The analysis of the corporate social responsibility practices in Lithuanian and global businesses was made according to the business' opinion about corporate social responsibility research, carried through by the World Bank, the research about transatlantic social reporting trends and the survey, accomplished by the authors, about the peculiarities of the Lithuanian companies' membership at the UN Global compact. It was estimated, that the main difficulties of the socially responsible business' development in Lithuania are the lack of time and other resources, miserable consideration of the government and its institutions and the absence of the financial success (Ruževicius and Navickaitė 2006).</p> <p>The analysis of corporate social responsibility development in energy sector of Baltic States is provided and positive impact of corporate social responsibility on sustainable energy development is evaluated. (Štreimikiene et al. 2008b).</p>
Training	<p>The Institute of Environmental Engineering (APINI) in Lithuania carries out a training program on the Classification, Labelling and Packaging of Dangerous Chemicals (preparation of the program was initiated and supported by the Baltic Environmental Forum [BEF], Latvia) in 2000, and participates as a partner in activities on chemical risk management in enterprises and on data collection strategies with regard to hazardous chemicals, carried out by BEF in Estonia, Latvia and Lithuania. Representatives from 64 enterprises and institutions have been trained. Different seminars, training and information materials, and handbooks should be a big help for industries (Kruopiene 2003).</p> <p>The importance of environmental education and public awareness is emphasized in the Lithuanian Environmental Protection Strategy approved by the government. Since 1996, the Commission of Education and Information Co-ordination for Sustainable Development has been functioning at the Ministry of Environment. It includes representatives of ministries, scientific institutions, business organizations and NGOs. The main task of the Commission is to co-ordinate information and to present guidelines to state, municipal, scientific and study institutions as well as to NGOs concerning the implementation of main legal acts of the Republic of Lithuania and international agreements on the issues of public awareness and education on sustainable development. industrial development. Since 1993, APINI lecturers participated in a series of different international projects on waste minimization, pollution prevention, cleaner production, environmental management systems (EMS), eco-design and eco-labelling, environmental impact assessment, integrated pollution prevention and control (IPPC) directive implementation, integrated water management and sustainable development.</p>

Water management

Technical universities in the Baltic Sea region in the framework of the BALTECH consortium decided to develop and implement a new M.Sc. Programme in Environmental Management and Cleaner Production, based on an integrated approach of industrial ecology towards current and long-term/strategic environmental issues, focusing on technologies and concepts in environmental planning and management for a sustainable industrial development (Staniškis and Stasiškiene 2006b).

Lake Žuvintas located in southern Lithuania in the basin of the Dovine river, is one of the biggest lakes and oldest nature reserves of the country. However, changes in the hydrology of the Dovine river basin, caused by a large-scale melioration and water management works carried out in the 20th century, have resulted in a significant decrease of the biodiversity of Lake Žuvintas and the surrounding wetlands. Two scenarios to evaluate the impact of the removal of sluice-gates built on the Dovine and Amalve rivers have been analysed to get an insight into the impact of water regime changes in the Žuvintas, Simnas, Dusia and Amalvas lakes and adjacent wetlands. For such scenarios, the method of mathematical modelling employing the SIMGRO model was used. The results have shown that the entire restoration of water dynamics and flow pattern of the Dovine river to its original state is impossible. The Dovine river has been modified to such a degree that the changes are hardly reversible. When striving for at least partial flow naturalization, reconstruction of the existing sluice-gates is necessary. As an effective measure, replacement of the sluicegates by overflow type spill-weirs of a complex shape can be considered. (Povilaitis and Querner 2007).

The nature reservation established in the Žuvintas preserves the old waterlogged lake, its surrounding wetlands and their unique fauna and flora. This lake has suffered a negative impact of economic activities which affected not only the reservation area itself, but also the basin of the Dovine river. Exploitation of the system shows that ecological objectives in the Žuvintas lake can be reached only by creating a hydrological regime similar to the natural one. In order to improve ecological state of the Žuvintas lake a complex of environmental measures is to be applied, one of the most significant being maintenance of the natural lake water regime (Gailiūšis, et al. 2007).

In 2003, the PIN-Matra project “Management and Restoration of Natura 2000 sites through an Integrated River Basin Management Plan of the Dovine River” (Lithuania), financed by the Netherlands Ministry of Agriculture, Nature and Food Quality, was started. Proposals for the management plan followed detailed investigations of the habitat and species diversity and status as well as estimation of the complex of hydrological conditions. Based on the Lithuanian River Cadastre, a list of the Dovine river basin water bodies has been compiled. The obtained level of investigations on these water bodies has been determined. With reference to the reports of the DANCEE project “Implementation of EU General Water Framework Directive in Lithuania”, the categories, typology, estimation and the main criteria for the ecological status of water bodies have been studied. Data on the diversity of water bodies in the Dovine river basin are presented. The categories and typology of water bodies most closely related to the sites under maintenance were specified and the estimation of their ecological status was carried out, based on the quality element parameters designated by the DANCEE project (Gulbinas et al. 2007).

Since 1984 the biggest Lithuanian Drukšiai Lake has started to serve as a cooler for the Ignalina Nuclear Power Plant (INPP). The INPP operation has disturbed the natural hydrological and hydrothermal regime causing intensified evaporation and exerting impact on the lake hydrochemical properties. The changes in the lake ecosystem were evaluated during the “NATO Integrated Water Management” pilot study and water temperature was determined as an indicator of the effects in the lake ecosystem. (Kriauciuniene and Sarauskiene 2008).

Kaunas was one of a few towns in Europe which had no waste water treatment plants (WWTP). Untreated waste water was discharged to the Neris and Nemunas rivers through 13 outlets. In 1992 the town started implementing the Water and Environment Project. The first stage of the project covered the modernization of four well-fields, 11 booster stations, 52 third lift drinking water stations, 56 waste water pumping stations by using funds from different European, Lithuanian and the enterprise “Kauno vandenys” financing sources. The first stage of Water and Environment Project was accomplished in 2002. In 2005 the second stage of Water and Environment was started in UAB “Kauno vandenys”. After the implementation of above mentioned WWTP extension the company will be exempted from pollution tax. (Kriščiunas 2005).

The research work is devoted for developing of the web service based Water Resource Management Information System (WRMIS) has been developed in accordance with the European Union Water Framework Directive and EIONET ReportNet infrastructure requirements to environmental water sector reporting by EU member states. The WRMIS portal allows the access to information of data warehouses on the surface water quality in rivers and lakes, ground water, and point sources (emissions). It is expected to include into the WRMIS the data warehouse of Marine water (located at the Centre of Marine Research, Klaipeda), and DW of hydro-meteorological data (located at the Lithuanian Hydro-Meteorological Service), to extend the functionality of the WRMIS prototype (Dzemydiene et al. 2008).