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INFO- JA TEHNOKESKUS
Estonian environment information centre

Report on the demonstration of progress achieved by 2005 by Estonia pursuant to article 5 (4) of the Decision 280/2004/EC

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1.1 Developments in national legislation

Major international environmental standards have been transformed into Estonian environmental legislation. The *Sustainable Development Act* (published in RT I 1995, 31, 384) prescribes the most general principles of sustainable development, thus serving as a basis for all environment related legislation and relevant national programmes. Therefore, the legal acts regulating the energy, industrial and transport sectors, i.e. the sectors that are the most important for the purposes of greenhouse gases, usually take into account major environmental issues. Several aspects of the environmental legislation are stipulated in the form of the Government and minister regulations.

As regards to the energy, from 1998 till 1 July 2003 the whole energy sector was regulated by the provisions of the *Energy Act*. Since 1 July 2003 the Energy Act was repealed and replaced with four sub-sector specific acts: *Electricity Market Act*, *Natural Gas Act*, *Liquid Fuel Act* and *District Heating Act.*

The *Electricity Market Act* (published in RT I 2003, 25, 153) regulates the generation, transmission, sale, export, import and transit of electricity and the economic and technical management of the power system. The Act prescribes the principles for the operation of the electricity market based on the need to ensure an effective supply of electricity at reasonable prices and meeting environmental requirements and the needs of customers, and on the balanced, environmentally clean and long-term use of energy sources. Regarding the planning for development of electricity sector it is stipulated in the Act that every three years, the Ministry of Economy and Communication has to prepare a development plan for the electricity sector and submit it to the Government for approval. This plan has to include environmental protection aspects as well. The plan is in the drafting phase. Within the context of the climate change the renewable energy support scheme was introduced into the Electricity Market Act – the obligation for power distribution companies to purchase electricity generated from renewable energy sources at a price of 0.81 EEK/kWh (51.77 €/MWh).

The *Liquid Fuel Act* (published RT I 2003, 21, 127) prescribes liquid fuel quality requirements, which become gradually more stringent and mechanisms for controlling fuel enterprises.

The *District Heating Act* (published in RT I 2003, 25, 154) regulates the activities related to heat production, distribution and sale in district heating networks and terms for the connection to the network. As to heat planning, the Act introduced the new for Estonia principle – "zoning of district heating" and relevant planning activities. The Act gives local governments the power to introduce zoning of heat supply based on analyses, carried out for alternative heat supply options during planning phase. The Act provides also that in order to increase energy efficiency, to preserve the quality of the environment and to use natural resources

rationally, the Government has to approve an energy conservation programme and an operational programme for the conservation programme.

Regarding the other laws related to energy the *Energy Efficiency of Equipment Act* (published in RT I 2003, 78, 525) should be pointed out. A new Act, repealing the previous one, entered into force on 1 January 2004. The new act was needed to ensure the full compliance with the EU requirements. The Act regulates the requirements for the energy efficiency and energy labelling of certain types of household appliances (refrigerators, washing machines, electrict ovens, etc.), heating equipment and installations as well as provides the bases of and procedure for their conformity assessment and attestation in order to increase the energy efficiency.

A completely revised *Ambient Air Protection Act* (RT 2004, 43, 298) was enforced in September 2004. The Act regulates activities, which involve the emission of pollutants into the ambient air, damage to the ozone layer, and appearance of factors causing climate change. The Act provides main principles for the control of ambient air quality, sets basis for emission standards, foresees measures for reduction of air pollution, etc. The Act harmonized Estonian legislation with the relevant EU *acquis*. The main objective of the Act is to maintain the quality of the ambient air in areas where the quality of the air is good and to improve the quality of the ambient air in areas where the quality of the air does not conform to the requirements. The Act stipulates that activities for the reduction of climate change have to be organised by the Ministry of Environment on the basis of the requirements for restriction the limit values of emissions of greenhouse gases provided by the UN FCCC and the Kyoto Protocol. The Act also provides that the possessors of pollution sources must take additional measures to reduce the emission levels of carbon dioxide and other greenhouse gases. A number of secondary level legal acts have been issued on the basis of this Act.

The *Environmental Monitoring Act* (published in RT I 1999, 10, 154) entered into force in 1999. The Act provides for the organisation of environmental monitoring, the procedure for processing and storing data obtained, and the relations between persons carrying out environmental monitoring and owners or possessors of immovable. The environmental monitoring is defined as the continuous observation of the state of the environment and the factors affecting it, with the main purpose to predict the state of the environment and to obtain data for programmes and plans and for the preparation of development plans.

The *Environmental Register Act* (published in RT I 2002, 58, 361) entered into force in January 2003. The Act provides the bases for the entry of data regarding natural resources, natural heritage, the state of the environment and environmental factors in the environmental register, for the retention of data in the register and for the processing and release of the data. The environmental register is a general national register with the function to retain and process data regarding natural resources, natural heritage, the state of the environment and environmental factors and to provide information:

- for the environmental permits for the right to use natural resources, for waste management or for release of pollutants or organisms into the environment;
- for organisation of the international exchange of data;
- for the preparation of development plans and other plans;
- for forecasting natural environmental factors and their impact.

The *Environmental Impact Assessment and Environmental Management System Act* (published in RT I 2005, 15, 87) entered into force on 3 April 2005 (except for some

provisions) replacing the *Environmental Impact Assessment and Environmental Auditing Act* (published in RT I 2000, 54, 348). The new Act provides legal bases and procedure for assessment of likely environmental impact, organisation of eco-management and audit scheme and legal bases for awarding eco-label in order to prevent environmental damage and establishes liability upon violation of the requirements of this Act. The aim of the new Act is to bring the Estonian laws and regulations concerning environmental impact assessment into full harmony with EU *acquis* eliminating the shortfalls in the previous act. The new act specifies the procedure and principles of environmental impact assessment; especially the strategic assessment is regulated in detail. The new act makes strategic environmental assessment mandatory in the case of national, county and local plans and programmes. The procedures of environmental impact assessment are prescribed in a more detailed way.

The *Environmental Supervision Act* (published in RT I 2001, 56, 337) entered into force in July 2001. The Act defines the nature of environmental supervision and establishes the rights and obligations of persons and agencies who exercise environmental supervision, the rights and obligations of persons and agencies which are subject to environmental supervision, and the procedure for supervisory operations.

The *Integrated Pollution Prevention and Control Act* (published in RT I 2001, 85, 512) entered into force in May 2002. The Act determines the environmentally hazardous activities and lays down the bases for the integrated prevention and control of pollution arising from such activities, in order to prevent or reduce the harmful effect of human activity to the environment.

The *Nature Conservation Act* (published in RT I 2004, 38, 258) entered into force in May 2004. The main purpose of the Act is to protect the natural environment by promoting the preservation of biodiversity through ensuring the natural habitats and the populations of species of wild fauna, flora and fungi at a favourable conservation status. The Act also promotes the sustainable use of natural resources.

The *Organic Farming Act* (published in RT I 2001, 42, 235) is also important among the legislation regulating the agricultural sector. According to the Act organic farming is the sustainable production of agricultural products reducing on the one hand the emissions of N_2O caused by the use of nitrate fertilizers and promoting on the other hand the development of effective and sustainable production. A number of secondary legislative acts have been issued on the basis of this act for regulating various aspects of organic farming.

The *Forest Act* (published in RT I 1998, 113/114, 1872) entered into force in 1999 and has been amended several times. The Act regulates the management of forest as a renewable natural resource to ensure human environment that satisfies the population and the resources necessary for economic activity without unduly damaging the natural environment. The Act provides also the legal bases for forest survey, forest management planning and forest management, and regulates the directing of forestry and organisation of forest management. The Act prescribes the obligation to prepare a forestry development plan at least in every ten years.

The new *Waste Act* (published in RT I, 2004, 9, 52), which entered into force in May 2004, provides the general requirements for preventing waste generation and the health and environmental hazards arising there from. It also prescribes the organisation of the waste management with the objective to reduce the harmfulness and quantity of waste. The Act

places the obligation to organise the transport of waste in densely populated areas on the relevant local governments. As a new element, the local governments are allowed to impose a waste tax by a regulation within their administrative territory in order to develop waste management.

1.2 Fiscal measures

The fiscal measures, which have impact on greenhouse gas emissions, include pollution charges, excise duties and VAT taxes applied on fuels and energy. During last years Estonia has gradually introduced excise duties on fuels.

Estonia has to meet the EU Directive 2003/96/EC for taxation of fuels and energy. Estonia was granted some transitional periods for introduction of taxation. Regarding the major source of the CO_2 in Estonia – the oil shale, the Directive 2004/74/EC stipulates that Estonia may apply a total exemption from taxation of oil shale until 1 January 2009. Until 1 January 2013, it may furthermore apply a reduced rate in the level of taxation of oil shale, provided that it does not result in taxation at below 50% of the relevant Community minimum rate as from 1 January 2011. Regarding to shale oil, Estonia is eligible to apply a transitional period until 1 January 2010 to adjust its national level of taxation on shale oil used for district heating purposes to the EU minimum level of taxation. The tax exemption for natural gas (methane) is permitted by the Directive 2003/96/EC, which allows an exemption on natural gas in those Member States in which the share of natural gas in final energy consumption was less than 15% in 2000. Exemption is for a maximum period of ten years after the entry into force of the Directive or until the national share of natural gas in final energy consumption reaches 25%, whichever will be reached sooner. There are no specific taxes imposed on electricity in Estonia. The Directive 2004/74/EC allows Estonia to apply a transitional period until 1 January 2010 to introduce the output taxation system on electricity.

The amendment (in force since 1 January 2005) to the Act stipulates that if bio-fuel has been added to motor fuel or heating fuel, the portion of bio-fuel contained in the motor fuel or heating fuel is exempted from excise duty. This provision needed approval from the European Commission (EC). In July 2005 the EC granted Estonia the relevant right: Estonia was authorised to exempt from excise duty non-synthetic bio-diesel, vegetable oils made from biomass and bio-ethanol made of agriculture products or plant products.

Regarding the pollution taxation, in Estonia emission into air only from stationary pollution sources is taxed. *The Pollution Charge Act* (published in RT I 1999, 24, 361) provides the rates for the charge to be paid for release of pollutants or waste into the environment, as well as the procedure for calculation and payment of the charge. Up to the year 2005 (incl.) the rates of pollution charges are fixed in the Act. The charge rates for emission of major pollutants into ambient air are given in the Table 4.5.2. The pollution charge for release of carbon dioxide into ambient air was introduced on 1st January 2000. At present, the CO_2 charge has to be paid by all enterprises with total capacities of boilers over 50 MW, excluding the ones firing biomass, peat or waste.

The Act provides higher rates (coefficients for fees: 1.2; 1.5; 2.0 and 2.5) for some areas in Estonia – densely populated, resort and recreation areas, and as well for areas with heavy industrial load. The Act also provides penalties for emissions without permits and emissions exceeding the volumes fixed in permits: the charges would be multiplied by 5.0 (in case of

CO, solid particles), 10 (for SO_2, NO_x, VOC and mercaptans) or 100 (in case of heavy metals). The Ministry of Environment has proposed to continue the increase of charge rates with the average pace of at least 20% per year. According to the plans of the Ministry the *Pollution Charges Act* will be replaced with the *Environmental Charges Act*, which would incorporate all provisions related to charges and fees on utilization of natural resources, as well as charges on pollution. The draft of the new Act has not yet been delivered to the Parliament.

It is essential, that the income from environmental taxes (pollution charges) from the energy sector would be directed mainly back to the energy sector, for instance, as a support to special purposed environmental investments. In June 1999 *the Act on the Use of Proceeds from the Exploitation of Environment* (RT I 1999, 54, 583) was amended by Parliament. It enabled the state, in accordance with the laws, to establish a foundation for organizing the use of proceeds from the exploitation of the environment. In November 2000 the Minister of Finance signed a regulation establishing the Centre of Environmental Investments, which started as the legal successor of the Estonian Environmental Fund to support environmental investments.

All fuels and energy types in Estonia, as a rule, are subject to taxation with the value added tax (VAT). According to the *Value Added Tax Act* (RT I 2001, 64, 368) in Estonia the standard VAT rate is 18% of the pre-tax value (i.e. 15.3 % of end-user price). The VAT is recoverable for most of enterprises. Regarding fuels, the only exception has been made for peat, peat briquettes, coal and fuel wood, sold to households, housing associations and churches, also to enterprises financed from state or municipal budgets. For these fuels the exemption provides a reduced VAT rate of 5% up to the 30 June 2007. The same provision is applied also to the district heat sold to these institutions. This tax allowance can be considered as distorting the market and slowing down investments into energy conservation measures. Since 1 July 2007 the standard VAT rate (18%) will be applied.

Since January 1997 the use of renewable resources in electricity production had been given preferential treatment by Value Added Tax Act: electricity generated by wind, and hydroelectricity was subject to the value added tax rate of 0% until Estonia's accession to the EU. Thereafter, i.e. since 1 May 2004, the regular 18% rate is applied.

1.3 Environmental monitoring and supervision

The Environmental Supervision Act defines the features of environmental supervision and establishes the rights and obligations of persons and agencies that exercise environmental supervision. The Environmental Inspectorate, Land Board, local government bodies and agencies carry out environmental supervision. By law, other government agencies may also be assigned environmental supervision functions.

The Environmental Inspectorate as an environmental supervision body operates in all areas of environmental protection. It has to implement measures provided by law for the prevention of illegal activities and implementation of mandatory environmental protection measures. It has to suspend unlawful activities damaging or dangerous to the environment. The Land Board implements measures provided by law for the inspection of the legality of land use, land readjustment and compliance with land recording requirements, and for the suspension or termination of illegal activities. Local governments or persons and bodies authorised by local government councils have to perform environmental supervision inspecting adherence to the

decisions related to environmental protection and use of environment established by the local government councils. All environmental supervision agencies and government agencies performing environmental supervision functions are required to submit information concerning supervision activities to the Environmental Inspectorate by the term and according to the form established by the Ministry of Environment.

The Energy Market Inspectorate exercises supervision over the energy market. Supervision over the liquid fuel market is exercised by the Tax and Customs Board. The Technical Inspectorate checks the technical condition of the energy equipment.

As provided in Environmental Monitoring Act, state environmental monitoring is organised by the Ministry of Environment and carried out pursuant to a relevant programme. Data from state environmental monitoring are to be stored in a general national register established. If the results of environmental monitoring indicate that the situation at an environmental monitoring station or site is becoming environmentally hazardous, the institution responsible for the environmental monitoring sub-programme is required to notify the Environmental Inspectorate and local health protection office immediately. Requirements for monitoring emission limit values at large (with rated thermal input equal to or greater than 100 MW_{th}) combustion plants are directly stipulated in the Ambient Air Protection Act – the concentrations of sulphur dioxide, particulate matter and nitrogen oxides must be measured at a continuous basis.

The Environmental Register is a general national register with the function to retain and process data regarding natural resources, natural heritage, the state of the environment and environmental factors, and to provide information. The data from the Environmental Register are used for issuing environmental permits for the right to use natural resources, for waste management or for release of pollutants into the environment. The Register is also used for the preparation of development plans, for organisation of the international exchange of data, etc.

1.4 Education

1.4.1 Environmental education in pre-primary schools

Estonia has enhanced efforts to develop and use curricula and teacher training focused on climate change as methods to integrate climate change issues at all educational levels and across the disciplines. As the number of children in pre-primary schools is slightly increasing, it is important to start with environmental projects already there. The children today will be adults in ten years and if they are used to behave in a sustainable way, the ideas will be carried over in the activities of the new generation also in their adulthood. Additionally, informing children about sustainability has positive influence on adults or parents. Our experience shows that it is possible to influence adults via children to be more environmentally friendly because the feedback from parents has shown it. The project “Green Spider” involves children of age 3–8 years. The main aim of this project is to prepare a teaching material about the environment where a fish called Lope is teaching children the sustainable way of living. The project partners are 13 European countries and in Estonia 260 pre-primary and primary schools are participating.

1.4.2 Environmental education in basic school and gymnasium

Having the environment and sustainable development as the underlying themes in the curricula is quite a new phenomenon in Estonian education system and therefore teachers and heads of schools need advice and training in these matters. To meet this demand, a successful environmental education project for schools "Tuulik", was organized by the Dutch Foundation of Permanent Education. EMI-ECO was the Estonian project coordinator. Partners included also the Ministry of the Education and Research, Tartu University, Tallinn University, Estonian Youth Work Centre and the Sagadi Nature School of the State Forest Management Centre. The project aims to make students aware of changes in the environment over time and take responsibility for the environment in which they live. The project materials are in Estonian and Russian and can also be obtained through the Internet.

In addition to Tuulik a number of other environmental projects are ongoing for schoolchildren. Internationally, GLOBE is being implemented through bilateral agreements between the US government and governments of partner nations. Among the 109 countries that have signed GLOBE agreements is also Estonia. Since Estonia joined the GLOBE Program in 1995, the impact countrywide has been impressive. The success is also the result of extraordinary cooperative efforts among the Estonian Ministry of Education, National Centre of Environmental Investments; the US Embassy in Tallinn; and the Nordic/Baltic Regional Environmental Office at the US Embassy in Copenhagen. The GLOBE Program is a valuable learning experience and promotes science as a communication. The academic year 2004/2005 was the 9th year of the GLOBE program in Estonia. Schools continued the environmental measurements and observations. The number of GLOBE schools in the country has increased to 46; the majority of the schools (27) have reported data during this year. The traditional annual events are the GLOBE student research project competition/conference, and the GLOBE Learning Expedition.

Nineteen schools from Estonia take part in the Baltic Sea Project (BSP) – the first regional Project within UNESCO *Associated Schools Project*. Teachers have got the materials like Learners' Guide 1–6. Over 600 pupils from 25 schools participated in the international project Naturewatch Baltic (NW). The Estonian Youth Work Centre organizes every year a contest of environmental research projects for schoolchildren. The best ones represent Estonia on the International Contest.

The idea of the project ÖKOKRATT (www.okokratt.ee) is to increase the environmental consciousness and sustainable lifestyle of Estonian population, especially children. The main goal is to explain the principles of sustainable lifestyle and to show what the human activities cause to environment (causes and effects) and to expand the activities to local governments. The environmental project Ökokratt was started in Kuusalu municipality and has successfully been going on since 1999. Kuusalu municipality has arranged several events in order to raise the awareness and change the attitudes of its residents and especially children, and in order to introduce the environmental situation and improve the situation of the environment. The events have been supported by enterprises, local governments and the Environmental Investment Centre. Enterprises have supported the events by introducing a company's product or service. Lectures and seminars for children and adults have been carried out. Considering the age and previous knowledge level, different approaches to topics have been used. Future plans are connected with the developing of an environmental consciousness supplementary education system for the staff of educational institutions (schools-kindergartens) and for municipalities in cooperation with Estonian and foreign partners. This project gives an

opportunity for young people to develop themselves during their free time (environmental education centre, environmental education portal, eco-camp, cooperation projects with young people from Estonia and other countries and with other similar organizations). The benefit from the project is investment in education and erudition. The more conscious the citizens, the cleaner will become the environment. In the framework of the environmental week events take place in the educational institutions every day and require active involvement of children and teachers (to carry out studies, to make things, to draw, to write poetry, to sing, to move in nature, to discuss, to organize exhibitions and quizzes, to organize a waste disco, a day of clowns, to visit places with problems). The aim is to provide knowledge considering the concrete age group and interests and to include all staff of kindergartens and schools and possibly parents. The project ends with festive delivery of the supplementary education certificates to teachers by the municipality and the trainers

Beside the running projects there is a system of various types of centres whose activities include environmental training. For example the State Forest Management Centre (RMK) has 7 nature centres: Aegviidu nature centre in the northern part of Estonia in Harju County, Pähni and Kiidjärve nature centres in southern Estonia, Kauksi nature centre in eastern Estonia, Mustjala nature centre on the island of Saaremaa, Kabli nature centre in Pärnu County and Nõva nature centre in Lääne County. Our best-known educational temple is the Sagadi Nature School in Lääne-Viru County. This system of the environmental education offers more than 360 one-day courses per year and about 14 000 persons (not only pupils but also teachers, parents, school administrators) took part in this education in 2004.

The Foundation Tartu Environmental Education Centre (TEEC) was established in 2002 on the basis of the former Tartu Loodusmaja (Nature House). The purpose of TEEC is to develop environmental awareness and to promote sustainable values of life through training programmes, projects and public information. The target group of TEEC includes children and adults living in Tartu and elsewhere in the southern part of Estonia, also different organizations, companies, the public sector etc. The aim is to influence public opinion towards sustainable development. Different environmental courses are being run by TEEC: nature trail organizing course, ecosystems and fieldwork. It is planned to build Tartu Ecohouse to create a proper home for TEEC in the future. The ecohouse project is being developed in cooperation with Tartu City Government. TEEC's priority is running projects that promote sustainable lifestyle. The following projects were organized in 2003: training courses for adults (sustainable office and home), Garbage Separation in Tartu City Government, Eco-team Project in Tartu Nature House and Eco-team Coach Training for Teachers in Estonia, Sustainable School, Coordination of Environmental Awareness projects in Tartu County financed by the Centred of Environmental Investments Centre, Children's Nature Summer Camp, Tartu Youth Bicycle Project, The Green File of Nature in Tartu – a study material project, Tartu Environmental Study materials, activity programmes in nature education.

In March 2003 a contract was signed between Tartu Environmental Education Centre (TEEC) and the US Embassy in Estonia. The US Embassy gives financial support to TEEC for an Environmental Education Development project in Tartu and South Estonia. The main goal of the project is to develop an environmental education system for adults and to run pilot courses. The financial support is also very important for TEEC in order to develop the whole organization.

1.4.3 Environmental education in higher schools

All Estonian public law universities have curricula in environmental education, devoted to sound environmental management, sustainable development, environmentally efficient power engineering, protection of the atmosphere etc. There are similar courses in the private universities. This topic is part of the curricula of the future teacher training but not in all specialities. The positive change is in Tallinn University where future journalists have an opportunity take the environmental education course.

1.4.4 Adult training

There are number of adult training institutions in Estonia where one can study environmental subjects. They are as business or non-profit organisations. EMI-ECO is one of them. EMI-ECO is a non-profit independent training and consulting organization following the principles of life-long training. The activities of the organization are aimed at increasing administrative capacity and competitiveness of enterprises and raising the educational levels of society.

1.5 NGOs

The environmental education is incorporated also to the activities of the 58 NGOs. Besides Friends of Earth – Estonia also the European Youth Forest Action Estonia, Estonian Geographical Society, Forest Youth, Estonian Union of Scout Supporter's Societies, Viljandi Youth Society for Nature Conservation, Estonian Ecotourism Association, Centre for Applied Ecology, Estonian Biology and Geography Teachers' Union, Estonian Environmental Women's Union, Tartu Students' Nature Protection Circle, Society for Nature Conservation of Tallinn; Sorex etc are dealing with environmental education and climate change issues. Peipsi Centre for Transboundary Cooperation is an international non-profit institution, which works to promote sustainable development and cross-border cooperation in the international catchment area of Lake Peipsi. In 2003–2005 this organization launched several small projects aimed at increasing public participation to solve environmental problems in the region.

REC Estonia was founded as a local office of REC in 1995. The task of REC Estonia is to assist in solving environmental problems by encouraging cooperation among governments, nongovernmental organizations, environmental businesses and other stakeholders. The Regional Environmental Center for Central and Eastern Europe (REC) was established by the United States, the European Commission and Hungary in 1990. Today there are local offices in 15 countries of Central and Eastern Europe while the headquarters is situated in Szentendre in Hungary.

Stockholm Environment Institute Tallinn Center (SEI-Tallinn) is a non-governmental, non-profit foundation, founded by SEI and registered under the Estonian law in 1992.

The mission of SEI-Tallinn is to direct the decision-making on the community development and environment towards balance and sustainability. One of the programme areas is Climate, Energy and Atmosphere. SEI-Tallinn conducts applied research and consults international organizations, governments and private organizations in the areas of the community development and environment.

Estonian Green Movement-FoE is a non-governmental, non-profit environmental organization. It was founded in 1988 as one of the first environmental NGOs in Estonia that started to deal with a wide range of environment and development issues. In its activities the Estonian Green Movement-FoE is backed by a nationwide active network of some 600 individual members.

Currently the Estonian Green Movement-FoE is one of the most influential environmental groups in Estonia, advocating for the environmental needs of Estonia's inhabitants. Estonian Green Movement-FoE has adopted the mission of responding to the regional environmental problems brought about by the political and social changes, and protecting Estonian natural resources at grass root, national and international levels. Its activities are carried out in the framework of seven permanent working groups, which are dealing with following issues: Consumption, Energy and Atmosphere, Forestry, Transport, Water and Youth.

1.6 Green Energy and Estonian Fund for Nature

Each Green Energy customer supports the Estonian Fund for Nature (ELF). The customer donations to ELF uses these funds to finance the projects of ELF related to nature conservation, environmental education and sustainable development. The Estonian Fund for Nature was founded in Tartu on 1 February 1991 as a non-profit NGO for the implementation of and fund-raising for environmental projects.

Since its foundation, ELF has participated in establishing nature protection territories with the total area of almost 100 000 ha, among them Karula and Soomaa National Parks, and Puhatu and Lower Pedja Nature Reserves. Today, ELF's main lines of activity are sustainable forest management, environmental education and sustainable development. In environmental protection, ELF collaborates with several international organizations, the most important of which are the World Wide Fund for Nature (WWF) in Sweden, Denmark and Finland, Danish Environmental Assistance to Eastern Europe (DANCEE), forest protection organizations Smartwood (US) and Nepenthes (Denmark).

ELF's cooperation partners in Estonia are the Ministry of the Environment, Estonian Institute for Sustainable Development, Friends of the Earth – Estonia, Estonian Ornithological Society, Estonian Youth Nature Protection Association, the City Governments of Tartu and Tallinn and several other local authorities, universities etc.

Alkranel LCC. The main tasks of this organization are promotion of environmental awareness and involvement of the public in environmental issues. The environmental specialists of Alkranel have an educational background of environmental engineering from the University of Tartu. Alkranel offers environmental consultation services in water and waste treatment technologies, water and waste management, environmental management, environmental impact assessment, environmental research and raising environmental awareness.

1.7 Research

The Estonian Science Foundation and Ministry of Education and Research have financed more than 54 research projects that are connected with climate studies. The spectrum of these studies is very wide the studies being connected with the atmospheric circulation processes,

ionization, analyses of satellite images and climate modelling. Investigations of this kind are the main goal of the research groups from the National Institute of Hydrology and Meteorology, Tartu Observatory and the Institute of Geography of the University of Tartu.

The interaction of water and terrestrial ecosystems and their response to climate change are the basic interest of researchers from the Estonian Agricultural University. Climate and the environment of the Earth are under increasing pressure of anthropogenic activity, which is likely to provoke climate warming, frequent droughts and other stresses that decrease the stability of forest ecosystems. The case studies reported consistent increasing trends in general height growth, as well as diameter growth of different tree species in Central and Western Europe. The same trends are traced also in Estonia. According to the forest inventory data the site index of Estonian forests was found to have increased during the last decades. The increasing trends in air temperature and precipitation, detected in meteorological time series in Estonia, may be partly responsible for the annual increase of tree growth. Results of the study should show trends in site conditions and in the growth of economically important coniferous stands. A better understanding of altered growth conditions may be useful for planning forest regeneration, for adjusting thinning regimes and final cutting strategies, andfor forest policy makers to ensure continuous sustainable management.

Climate warming may cause also changes in the matter cycling of the lake ecosystems. A research group from the Institute of Ecology at Tallinn University is studying the processes in the past to better predict the future trends. Scientists from the Estonian Limnological Centre of the Estonian Agricultural University are following the situation in small and large lakes of Estonia.

The studies concerning the effect of climate change on the Baltic Sea and the Estonian coast have continued at the Marine Institute at the University of Tartu, Marine Systems Laboratory of Tallinn University of Technology and the Institute of Ecology at Tallinn University. Owing to a relatively long coastline (3800 km) and flat and low-lying bays, frequent and strong storms resulting from climate change and combined with sea-level rise could destroy many valuable ecosystems in the coastal areas of Estonia. Extensive erosion and destruction of depositional coasts, e.g. sandy beaches, has been observed in Estonia in recent years. The basic research theme of the Department of Landscape Ecology of the Institute of Ecology "Climate change impact on the structure and functioning of wetlands" is focusing the impact of increased storminess on different shore types. The project originates from Agenda 21 and several other international agreements that clearly call for more integrated management of coastal and ocean resources.

As an example of applied research projects connected with the climate change impact is the breeding of new potato and fruit varieties that are resistant to changing climate conditions. Studies on the phenological trends connected with climate change are an interesting topic that is studied by researchers from the Institute of Geography of the University of Tartu. This project is part of the larger R&D project of the 5th Framework. There are also other international co-operational research projects on climate change topics.

1.8 Cooperation at national levels

The Sustainable Development Committee approved the Estonian sustainable development strategy "Sustainable Estonia 21" on 14 September 2005. This enables the Ministry of the Environment to submit the strategy to the Government of the Republic for approval.

"Sustainable Estonia 21" (SE21) is a strategy for the development of the Estonian state and society until 2030. The strategy creates the general framework for interconnecting the social, economic and environmental spheres in terms of long-term development of the society and defines the general objective of the development for Estonia as movement towards the so-called knowledge-based society. The long-term objectives of development determined in the strategy are: vitality of the Estonian cultural sphere (maintaining national traditions), greater well-being, coherent society (without sharp social conflicts) and ecological balance. Knowledge-based society is a type of comprehensive social order marked by a new operating and decision-making culture in which the achievement of commonly set and accepted objectives is based mainly on knowledge and analysis.

By approving the SE21 and achieving its aims Estonia takes part in shaping the development policy of the European Union as well as the whole world. The preparation of the strategy was coordinated by a consortium led by Tallinn University (TLU) and consisting of TLU, TLU Institute of International and Social Studies, TLU Institute of Ecology, and AS Lõhmus, Haavel and Viisemann. It was an extensive and open process during which all materials were available for commenting to all interested parties at the Ministry Internet address under the heading Sustainable Development/Estonia.

The preparation of the Estonian strategy of sustainable development called "Sustainable Estonia 21" was based on the initial tasks approved by the Government of the Republic in 2002 and the project was led by the Sustainable Development Committee. Estonia 21 website houses an organized collection of publications, references, events, projects and links related to sustainable development in Estonia and around the world. The site is in Estonian and English and the target audience is mainly local governments, community planners, NGOs and anyone interested in sustainable development.

2. Information on trends in and projections of greenhouse gas emissions at national level

2.1 Trends in greenhouse gas emissions

The trends are developed on the base of the inventory data submitted by Estonia to the UNFCCC by 15 April 2005.

In 2004 the total emission of greenhouse gases measured as CO_2-equivalents, was 13 005 Gg, without CO_2 from LUCF 21 021 Gg. From 1990 to 2004 the emissions decreased by 50.7%. This huge decrease was caused by the transition from planned economy to market economy and successful implementation of necessary reforms. The emissions during the period 1990–2004 are given in Annex 1 of this report.

In 2004, the most important greenhouse gas in Estonia was carbon dioxide (CO_2), contributing 90% to total national greenhouse gas emissions expressed in CO_2 equivalent, followed by methane (CH_4), 8.2%, and nitrous oxide (N_2O), 1.7%. Emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) have not been estimated. The energy sector accounted for 91.9% of total greenhouse gas emissions, followed by agriculture and waste management (2.6% each) and industrial processes (1.9%).

Over the period 1990–2004, emissions from the energy sector decreased by 50.2%, emissions from the industrial processes and waste sectors decreased by 35% and 28.7%, respectively, and reductions of 68.9% occurred in emissions from the agriculture. Reported net CO_2 removals in the land-use change and forestry (LUCF) sector increased by 21.2% between 1990 and 2004.

2.2 Projections in greenhouse gas emissions based on Estonia's Fourth National Communication

The greenhouse gases emission scenarios for Estonia are determined by the development scenarios of Estonian energy sector. In general, the projections for CO_2 emission represent well the projections for greenhouse gas emissions in total. Three CO_2 emission scenarios – with measures (WM), with additional measures (WAM) and without measures (WOM) were derived by modelling of the Estonian energy sector with the help of MARKAL model.

2.2.1 With measures (WM) scenario

In the scenario the following measures' policies and basic assumptions were considered:

- Starting from 2008 all power plants have to comply with the EU directive on the limitation of emissions into the air from large combustion plants. During the accession negotiations with the EU Estonia got some transition periods but the existing oil shale

pulverized combustion boilers cannot work after 2015. Estonia has to close these boilers before the end of 2015 in accordance with the schedule agreed with the EU. As a result, only 6% of the capacity of power plants that existed in the 1990s (over 3000 MW) can continue operating after 2015.

- Estonia will fulfil requirements on emission reductions and introduction of renewable energy sources. The national target for the introduction of RES in electricity production is 5.1% of the total domestic electricity consumption in 2010. Estonian Environmental Strategy and agreements with Finland state that sulphur dioxide (SO_2) emissions in 2005 should not exceed 20% of the 1990 level, emission of solid particles must be reduced by 25% as compared to 1995 and NO_X emissions should not exceed the 1987 level.
- Environmental taxes continue to increase 20% annually and they will reach the European forecast values at the end of the planning period.

According to the Estonian Pollution Charge Act the level of fees for emissions that do not exceed the volume limits were the following:

	Pollutant						
	SO_2	CO	CO_2	Nontoxic dust	Oil shale ash, fly ash	Soot and coal dust	NO_X
Charge €/t	3.53	0.50	0.32	2.53	3.53	5.06	8.08

There are different multiplication coefficients of fees (from 1.2 to 2.5) depending on the location of the pollution source. The fees will rise 5–100 times if the permitted volumes are exceeded.

- To fulfil the environmental requirements of the year 2005, reconstruction of two production units of the oil shale power plants with the total net capacity of 390 MW. The reconstruction of all fly-ash filters was completed in 2004. The new units use circulating fluidized bed combustion technology that raises conversion efficiency from 29% to 34% and minimizes sulphur emissions. Next steps in the new capacity building will be decided after gaining experience from the operation of the first fluidized bed units. Considerable options are also coal, peat and co-combustion of different fuels. It is important to continue research of pressurized fluidized bed combustion of oil shale. Only this technology could provide oil shale plants the necessary conversion efficiency (ca 44%) and emissions reduction in the longer perspective.
- Ash removal systems of oil shale power plants have to be renewed before July 2009.

Practical aspects:

Power plants continue to use oil shale as the main fuel. During 2004-2015, 1230 MW of new condensing and 190 MW of new CHP net capacity will be built using CFBC technology. The new capacity will replace less than half of the initial installed capacity of the old pulverized combustion plants. This will raise the average conversion efficiency from 28% to 34%, eliminate sulphur emissions and solve fly ash problems.

The more advanced pressurized fluidized bed combustion (PFBC) technology will not be used for oil shale power plants. Despite this technology could give conversion efficiency of 44% and lower CO_2 emissions the large-scale implementation of technology is technically questionable today.

At the end of the planning period, a coal power plant will be built.

The total capacity of the CHP plants will increase quite rapidly providing the main future solution for heat production as well. This tendency is common in all scenarios. The CHP potential will be used fully at the end of the planning period in all scenarios, only market shares of different fuels differ by scenarios.

Renewable will be used extensively under this scenario. Wood fuels will reach their resource limit quite fast and the capacity of windmills will reach the limit at the end of the planning period. More extensive use of renewable energy would require import of cheap biomass (wood).

Condensing natural gas power plants will be built starting from 2010. Their capacity will be substantial, but their utilization factor will be very low. They will be used for covering sharp peak loads, balancing wind power and for reserve capacity. One reason for the low utilization factor is the limited possibility of MARKAL model to describe the load curve in detail.

The main driving factors for CO_2 reduction are the improvement of the conversion efficiency of fossil technologies, and increase in the share of CHP and renewable. In spite of decreasing specific emissions, the total CO_2 emissions will increase after 2005 due to growing energy consumption. The increase is not fast and the emissions will not reach 1995 level, not to speak about the 1990 level.

2.2.2. With additional measures (WAM) scenario

The following basic assumptions were made:

- The long-term objective of the National Programme is reduction of greenhouse gas emissions by 21% by 2010 as compared with the 1999 emission level. This includes reduction of carbon dioxide emissions by 20%, reduction of methane emissions by 28%, and increase of nitrogen dioxide emissions by 9%.

Development in accordance with the information given above yields an infeasible solution with assumptions described before.

Instead the following scenarios are used:

a. WAM-LEVEL1 – gradual reduction of CO_2 emissions by 1% during 2010-2030 compared to the 2010 level in WM scenario.

b. WAM-LEVEL2 – gradual reduction of CO_2 emissions by 15% during 2010-2030 compared to the 2010 level in WM scenario.

Practical aspects:

CO_2 emission limits will be met mainly by wider use of natural gas in high efficiency condensing power plants. Use of oil shale in electricity generation will decrease and PFBC technology will be a considerable option starting from 2015.

The higher the target for CO_2 reduction, the higher will be the share of imported energy carriers (mainly natural gas in addition to motor fuels, coal and fuel oils).

2.2.3. Without measures (WOM) scenario

All political measures and basic assumptions described in **Error! Reference source not found.** were excluded.

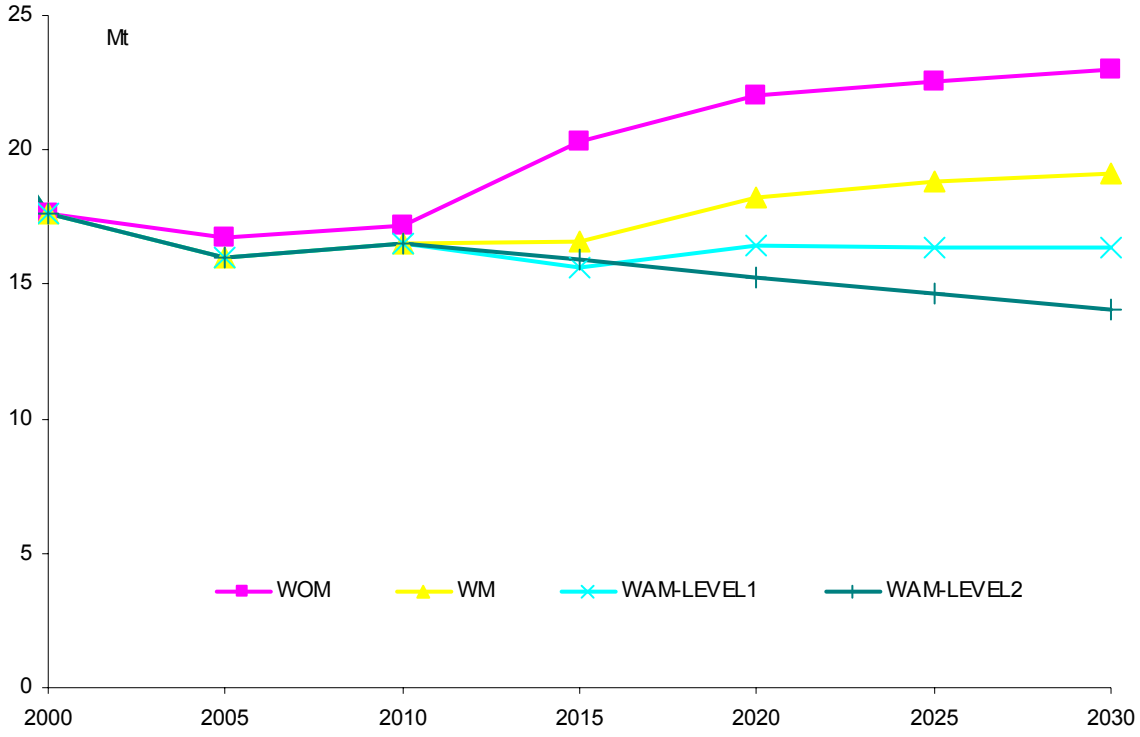
Practical aspects:

Power plants continue to use oil shale as the main fuel. The existing capacity of power plants will be utilized until the end of planned lifetime. During 2004–2010, 200 MW of new condensing and 190 MW of new central heat and power plant net capacity will be built using CFBC technology to replace the capacity of the old pulverized combustion plants. Coal will dominate after 2015.

2.2.4 Results

According to modelling results, Estonia's CO_2 emissions from energy sector will not climb up to the Kyoto limit under any scenario. This attractive phenomenon can be taken into account by developing of other sectors of the national economy.

Figure 1. CO_2 emissions from the energy sector



3. Evaluation of the domestic measures referred to in chapter 1 in the light of the trends and projections referred to in chapter 2

According to the content of chapter 1, all eight domestic measures were selected for the evaluation.

Measure	Related to energy sector's projections	Evaluation
New acts in national legislation	WM, WAM,	Long-term, direct, indirect and effective impacts
Fiscal measures	WM, WAM,WOM	Short-term direct, effective impact
Monitoring and supervision	WM, WAM,WOM	Quick directive impact
Education	Irrelevant for scenarios	Long-term and indirect impact
NGOs contribution	WM,WAM	Long-term direct impact
Green Energy and Estonian Fund for Nature	WM, WAM	Permanent direct impact
Research	WAM	Long-term direct impact
Cooperation on national level	WM,WAM	Occasional, direct and indirect impacts are possible

4. Description of the activities, actions and programmes undertaken by Estonia for the purpose of meeting its commitments under Articles 10 and 11 of the Kyoto Protocol

4.1 National Environmental Strategy

Up today the *National Environmental Strategy*, approved by the Parliament in 1997 (published in RT I 1997, 26, 390) has served as the underlying document for planning of environmental policy. This environmental policy document provides general guidelines and objectives for environmental management and protection, establishes the most important goals to be achieved by the year 2010. Based on the objectives and tasks of the Strategy the *National Environmental Action Plan* was developed in 1997–1998. The action plan is a subject to regular revisions. The latest phase of the document (for the years 2001–2003) was approved by the Government in June 2001 and the Ministry of Environment was appointed as the agency responsible for the implementation of the action plan. The draft of the Action Plan for the next period (up to 2006) is in the process of preparation. At the same time, the new national environmental strategy is currently at the drafting stage as well.

4.2 Long-term National Development Plan for the Fuel and Energy Sector

In Estonia the first national long-term development plan for the energy sector was passed by the Parliament (Riigikogu) in 1998. The next plan – *Long-term National Development Plan for the Fuel and Energy Sector until 2015* – was approved by the Riigikogu in December 2004. This development plan is based on the Sustainable Development Act (RT I 1995, 31, 384) and provides guidelines for the development of the fuel and energy sector until 2015. The Plan defines the current situation in the sector, presents issues set out in the EU accession treaty, prognoses developments of the energy consumption, sets the strategic development objectives for the energy sector, as well as the development principles and the extent of the necessary investments. The document is accompanied with the assessment of the strategic environmental impact of development scenarios proposed in the Plan.

In the second half of 2005 the Plan will be supplemented by the *Electricity Sector Development Plan*, preparation of which is stipulated by the Electricity Market Act (RT I 2003, 25, 153). The strategic objectives of the Estonian fuel and energy sector presented in the Plan include the following environment related targets:
- ensure that by 2010 renewable electricity forms 5.1 per cent of the gross consumption;
- ensure that by 2020 electricity produced in combined heat and power production stations forms 20 per cent of the gross consumption;
- ensure that, in the open market conditions, the competitiveness of the domestic market of oil shale production is preserved and its efficiency is increased, and apply modern technologies which reduce harmful environmental impact;
- ensure compliance with the environmental requirements established by the state;
- increase the efficiency of the energy consumption in the heat, energy and fuel sector;

- until 2010, maintain the volume of primary energy consumption at the level of the year 2003;
- develop measures which enable the use of renewable liquid fuels, particularly biodiesel, in the transport sector.

On 22nd of December 2005, the Estonian Government accepted the *Electricity Sector Development Plan* for next 10 years. According to the plan, the annual level in electric-energy generation from non-fossil energy sources has to reach 800 GWh level by the year 2015. It means that the use of oil-shale as a fuel for energy power plants will diminish from current level 90% to 70%.

4.3 National programme to reduce the emission of greenhouse gases

In April 2004 the Government approved the *National Programme of Greenhouse Gas Emission Reduction for 2003-2012* (published in RT L 2004, 59, 990). The goal of the Programme is to meet the targets set by the UN FCCC and the Kyoto Protocol. The Programme gives an overview of the Kyoto commitments and analyses the implementation strategy and action measures for Estonia. A special attention has been given to strategy, structure and costs of greenhouse gas emission trading and joint implementation projects. The long-term objective of the National Programme is reduction of greenhouse gas emissions by 21% by 2010 as compared with the 1999 emission level. This would include reduction of carbon dioxide emissions by 20%, reduction of methane emissions by 28%, and increase of nitrogen dioxide emissions by 9%. The sub-objectives of the programme are following:
- determining the possibilities for reducing anthropogenic emissions of greenhouse gases;
- offering possibilities for reducing anthropogenic emissions of greenhouse gases in order to reduce human impact on potential climate change;
- developing the flexible mechanism of Joint Implementation along the lines of the Kyoto Protocol to reduce greenhouse gas emissions;
- determining project themes for Estonia, suitable for Joint Implementation on the basis of the Kyoto Protocol and preparing a relevant database;
- increasing the energy efficiency of the Estonian economy (reducing energy intensity).

4.4 Joint Implementation

Joint Implementation (JI) is one of three flexible mechanisms introduced by the Kyoto Protocol for reducing greenhouse gas emissions. Already in 1993 Estonia became involved in the early pilot stage of the JI – Activities Implemented Jointly (AIJ). In cooperation with the Swedish National Board for Industrial and Technical Development (NUTEK/STEM) a number of renewable energy projects were carried out. Investments were made by the Swedish side. The projects were mostly aimed at rebuilding boilers to start using local wood instead of imported liquid fuel, but included also energy conservation projects – renovation of district heating networks, insulation of residential buildings and installing DH substations in block houses. In total, Sweden and Estonia have registered 21 common AIJ projects in the Climate Secretariat in Bonn. The annual reduction of CO_2 emission in Estonia was estimated to be more than 80 thousand tons.

By today, Estonia has signed the memorandums of understanding on JI with Finland (2002), Netherlands (2003), Denmark (2003) and Sweden (2005). The negotiations with Austria are in progress and with Belgium in preparation phase. Up to now (as of September 2005), the

assessed and approved impact of JI projects on CO_2 emission is 260.3 thousand t of CO_2 assigned amount units (AAU) and 368.5 thousand t of CO_2 emission reduction units (ERU).

In February 2004 the Government adopted the accession of Estonia to the *Agreement on a Testing Ground for Application of the Kyoto Mechanisms on Energy Projects in the Baltic Sea Region* (published in RT II 2004, 22, 92). The Testing Ground for international cooperation in the use of Kyoto flexible mechanisms was started with the main objectives to build capacity and competence to use the JI mechanism, to promote the realisation of high quality projects in the energy sector generating emissions reductions. The other objectives include collaboration in addressing administrative and financial barriers, and minimization of transaction costs, especially regarding small-scale JI projects. The Agreement also facilitates ensurance of issuing and transferring of ERUs and AAUs related to or accruing from JI projects.

ANNEX 1

GREENHOUSE GAS EMISSIONS	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	CO_2 equivalent (Gg)															
Net CO_2 emissions/ removals	31 787	31 787	28 752	18 325	10 858	13 773	11 533	10 657	11 118	9 795	8 664	8 484	7 685	8 748	10 389	10 915
CO_2 emissions (without LUCF)	38 107	38 107	35 915	26 142	20 553	21 378	19 315	20 264	20 225	18 318	16 771	16 849	17 103	17 312	19 106	18 931
CH_4	3 467	3 467	3 351	2 846	2 033	2 275	2 221	2 189	2 199	2 036	1 939	1 979	1 770	1 672	1 727	1 726
N_2O	1 069	1 069	1 047	861	570	515	449	425	461	467	395	450	400	350	349	364
HFCs	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PFCs	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
SF_6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (with net CO_2 emissions/ removals)	**36 323**	**36 323**	**33 150**	**22 033**	**13 461**	**16 564**	**14 203**	**13 270**	**13 778**	**12 299**	**10 998**	**10 913**	**9 856**	**10 770**	**12 465**	**13 005**
Total (without CO_2 from LUCF)	**42 643**	**42 643**	**40 313**	**29 849**	**23 157**	**24 168**	**21 985**	**22 877**	**22 884**	**20 821**	**19 105**	**19 278**	**19 273**	**19 333**	**21 183**	**21 021**

GHG SOURCE AND SINK CATEGORIES	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	CO_2 equivalent (Gg)															
1. Energy sector	38 829	38 829	36 606	26 735	20 958	21 874	19 891	20 948	20 873	18 717	17 155	17 308	17 590	17 734	19 645	19 320
2. Industrial Processes	614	614	615	313	193	215	221	207	226	368	347	354	356	340	276	399
3. Solvent and Other Product Use	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4. Agriculture	2 440	2 440	2 328	2 050	1 480	1 358	1 117	909	921	911	775	808	769	702	732	758
5. Land-Use Change and Forestry	-6 317	-6 317	-7 160	-7 814	-9 693	-7 603	-7 782	-9 607	-9 107	-8 522	-8 107	-8 365	-9 417	-8 564	-8 717	-8 015
6. Waste sector	757	757	762	749	523	720	755	813	865	826	829	808	559	557	528	543

NE - not estimated