MINISTRY OF THE ECONOMY

National Energy Efficiency Action Plan (NEEAP) 2007

Warsaw, June 2007

1 Introduction

The National Energy Efficiency Action Plan (NEEAP) fulfils the provisions of Art. 14(2) of Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 *on energy end-use efficiency and energy services*.

This document describes the indicative energy savings target adopted for 2016 in absolute units. This is to be achieved over nine years starting from 2008 in accordance with Art. 4 of the Directive mentioned above. A national intermediate energy savings target has also been adopted for 2010, which is indicative in nature and constitutes a path for the attainment of the target adopted for 2016 and which will help in assessing progress towards it. In addition, the document provides a description of the funds and the national measures that are to be implemented or planned on the basis of these funds aimed at achieving the national indicative targets within the projected time-scale.

The funds and measures proposed under the National Energy Efficiency Action Plan (NEEAP) are aimed at:

- Achieving the indicative target for energy savings as required by Directive 2006/32/EC, i.e. 9% in 2016,
- Achieving an intermediate target of 2% in 2010.

The following assumptions were used in preparing the National Energy Efficiency Action Plan (NEEAP):

- The measures proposed comply with the measures proposed by the European Commission in its document 'Action Plan for Energy Efficiency: Realising the Potential', COM(2006) 545.
- The proposed measures will depend to the maximum degree on market mechanisms and to a minimum level on financing from the budget,
- The realisation of the targets will be achieved according to the principle of least cost (i.e. *inter alia*, using existing organisational infrastructure and mechanisms where possible),
- It has been assumed that all entities will participate in order to use the whole country's energy efficiency potential.

2 National energy savings indicative target

2.1 Calculation for the national energy savings target expressed in absolute terms

Table presenting calculations for the national energy savings target

	2001	2002	2003	2004	2005	2001-2005 average
Final energy consumption [in GWh]	**649 070**	**628 172**	**642 418**	**656 583**	**703 011**	**655 851**
Exemption: energy consumption in installations listed in Annex I to Directive 2003/87/EC (Emissions Trading Directive)						**61 943**
Final energy consumption, excluding the installations listed in Annex I to Directive 2003/87/EC [in GWh]						**593 908**
Of which: Residential sector [GWh]	223 436	210 410	205 421	202 525	216 004	
Services [GWh]	61 592	68 105	72 594	70 001	69 536	
Industry [GWh]	197 466	188 383	194 907	201 083	217 830	
Transport [GWh]	106 542	104 461	118 045	131 407	147 434	
Agriculture [GWh]	60 034	56 813	51 451	51 567	52 207	
	Average final energy consumption in the years 2001-2005					**593 908 GWh**
	Target in Directive 2006/32/EC (9% in year 9)					**53 452 GWh**
	Energy savings target adopted for 2016 (9%)					**53 452 GWh**
	Intermediate target set for 2010 (2%)					**11 878 GWh**

A detailed description of the method used for calculating the national energy savings target has been presented in the Annex to the National Energy Efficiency Action Plan (NEEAP).

2.2 Specific aspects in the calculation of the national target

2.2.1 Description of how data on final national energy consumption is collected and generated.

In Poland, statistical information on energy efficiency is collected by a series of specialised institutions. Energy consumption data is obtained from research carried out by the Energy Market Agency S.A. using forms G-02a, G-02b and G-03, and then published in the public statistics kept by the Central Statistical Office. In addition, data from other research is used, as is data from the administrative databases of the Energy Regulation Office and the Energy Market Agency S.A., as well as data from the internal information system at the Industrial Development Agency S.A., data from the Polish Liquid Fuels Chamber and operators and distributors of liquid and gaseous fuels, electricity and heat.

The furthest reaching research on the fuel and energy sector is the research into the balance of fuels and energy. A group of several thousand specially selected businesses and their local branches takes part in this research. Statistical data is collected as part of this research using the G-02a, G-02b and G-03 reporting forms.

These forms contain a balance-sheet report for energy carriers prepared once each year by legal persons, organisations that do not have legal personality and their local units as well as by natural persons carrying out an economic activity. All of the above organisations and persons are selected by a targeted method. Reports cover all carriers appearing in the national energy balance. Statistical research carried out using these report forms makes it possible to collect information on the amount of fuel used, energy capacity, electricity generation as well as heat production.

2.2.2 Issues relating to the exclusion of the installations covered by the EU emissions trading scheme (listed in Annex I to Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowances trading within the Community)

Directive 2006/32/EC applies to all end users, but, according to Article 2, does not apply to those installations that fall into the categories listed in Annex I to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowances trading within the Community.

In order to set the national energy savings target accurately, it is necessary to deduct the final energy consumption of the installations that fulfil the criteria contained in Annex I to Directive 2003/87/EC from the total final energy consumption in Poland.

In national legislation it is the Regulation of 6 March 2007 issued by the Minister of the Environment *amending the Regulation concerning types of installations covered by the EC emissions trading scheme* that describes these installations.

Data on the energy consumption of individual types of installations covered by the EU trading system for greenhouse gas emission allowances is held by the National Administrator for the Emissions Allowances Trading System [NAEATS].

The level of energy used in installations covered by the emissions trading scheme, which is needed in order to calculate the national indicative target, was estimated using 2005 data collected by NAEATS for the purpose of monitoring the emissions trading scheme.

This data was collected on the basis of verified reports for annual CO_2 emissions in 2005 sent to NAEATS by the operators of the installations covered by the emissions trading scheme. The method used for monitoring CO_2 emissions and for reporting information about CO_2 levels as well as levels of fuel consumption and the amount of electricity obtained from burning this fuel is set out in the Regulation of 12 January 2006 issued by the Minister of the Environment *concerning a method for monitoring emission levels of substances covered by the EU emissions trading scheme*.

Data concerning energy introduced in fuel in 2005 by different types of installations covered by the EU emissions trading scheme was calculated as the total of the energy obtained from fuel consumed in the installations listed in the table 'CO_2 emissions from fuel combustion processes (calculations)' verified in the reports of annual CO_2 emissions in 2005.

The accuracy of the data sent to NAEATS in annual CO_2 emissions reports is verified by accredited inspectors and the Voivodship Environmental Protection Inspectorate.

2.2.3 Conversion factors used

The table that constitutes Annex 2 to Directive 2006/32/EC provides calculation factors to be used for selected fuels when converting them to standard units (e.g. kWh, ktoe) in order to be able to compare energy savings made by end-users.

The conversion factor for 1 kWh of electrical energy into a calorific value expressed in kWh is 1. The footnote to this value states that for electricity savings achieved that are expressed in kWh, Member States can use a standard factor of 2.5, which expresses an estimated 40% average efficiency in the production of electrical energy in the EU (Member States can, where this is justified, also use other factors).

The level of the estimated indicative target for Poland is 53 452 GWh. Electricity constitutes 16% of this total. The conversion factor used for 1 kWh of electricity was 1.

3 Description of energy efficiency improvement programmes, energy services and other measures to improve energy efficiency by final end-user sector.

3.1 Energy efficiency improvement measures in the residential sector.

3.1.1 Table presenting energy efficiency improvement measures in the residential sector

No.	Planned energy efficiency improvement measure	End-use energy efficiency improvement action targeted	Duration
1	Introduction of energy evaluation system for buildings	Certification of new and existing residential buildings carried out as a result of the implementation of Directive 2002/91/EC	2009 to 2016 – ongoing process
2	Thermo modernisation Fund	Running energy efficiency modernisation projects for the residential sector	1998 to 2016 – ongoing process
3	Promotion of rational energy consumption in residential dwellings	National information campaign on the desirability and financial savings from the use of the most energy-efficient products	2008 to 2016 – ongoing process

3.1.2 Description of individual energy efficiency improvement measures

Title	**1. Introduction of energy evaluation system for buildings**
Category	*Compulsory regulations* – technical standards
Area	Nationwide
Target group	Residential sector: administrators of buildings, owners of residential buildings, apartments and single-family dwellings, housing cooperatives, energy experts, individuals providing independent technical services in construction, construction companies and manufacturers of building products.
Priority measures	Improved energy efficiency in new and existing residential buildings, promotion of renewable energy resources in buildings. Ensuring the implementation of measures leading to real energy savings as recommended in energy performance certificates issued for buildings. Running an information campaign concerning energy performance certificates for buildings. Raising awareness and improving behaviour (e.g. promoting energy saving habits, changes to everyday behaviour).
Effectiveness (indicators)	Agreements between various state administration bodies involved in implementing Directive 2002/91/EC. Input worked out in the context of participating in European Union programmes supporting further development of energy performance

	certificates for buildings. Number of exemplary measures relating to the transfer of knowledge and experiences as regards buildings with high, medium and low energy consumption and evaluating possibilities for repeating these measures. Number of exemplary buildings stimulating interest from the media that provide an example of the implementation of Directive 2002/91/EC, number of interested media. Number of trained construction employees and experts, evaluation of the effects of P.R. activities as regards the number of persons that were reached.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2009 to 2016 – ongoing process.

Title	**2. Thermo modernisation Fund**
Category	*Financial instruments*
Area	Nationwide
Target group	Residential sector: building administrators, owners of residential property, apartments and single-family dwellings, housing cooperatives, energy auditors, construction companies, manufacturers of building products.
Priority measures	Improvement in energy efficiency of existing residential buildings, promotion of the use of renewable energy sources in buildings. Ensuring the implementation of energy efficiency modernisation measures leading to real energy savings for the end-user. Financial assistance from the state for investors carrying out undertakings with the help of loans taken from commercial banks leading to savings in energy consumption in district heating and hot water requirements. Carrying out and verifying energy audits on residential housing, public buildings, local heating networks, local heat sources, buildings with multiple occupancy. Promotion of energy saving technology in house construction. Running information campaigns about energy saving buildings and the correct way to use the effects of energy efficiency modernisation in existing buildings and good buildings management.
Effectiveness **(indicators)**	Number of exemplary measures relating to the transfer of knowledge and experience as regards buildings with high, medium and low energy consumption. Number of premiums awarded and paid, constituting state aid for investors carrying out energy efficiency modernisation measures. Growth of interest in the energy efficiency modernisation programme, systematic growth in the number and value of projects carried out. Number of exemplary buildings that are examples of energy saving technology in residential housing, number of interested investors. Number of trained construction employees and experts, evaluation of the

	effects of P.R. activities from the point of view of persons that they reached.
Status of implementation **Timeframe**	Earlier measures having a lasting effect; 1998 to 2016 – ongoing process

Title	**3. Promotion of rational energy consumption in residential houses**
Category	*Information and advice* – energy efficiency labels, targeted information campaigns *Energy services*
Area	Nationwide
Target group	Residential housing sector: owners of apartments and single-family dwellings.
Priority measures	Running a nationwide information campaign as regards the desirability and cost-effectiveness of using the most energy efficient products. Changing lighting in residential buildings for low-energy lighting. Changing old energy inefficient domestic equipment for new energy saving equipment. Exchange of information, best practice and the use of tax incentives and discounts for manufacturers of domestic equipment and for consumers. Encouraging sales staff and consumers to pay more attention to energy efficiency labelling and to the information provided in the technical specification of products bought and sold. Measures aimed at clarifying, verifying and enforcing the correct display of energy efficiency labels. Design, creation, sale, use and disposal of products that consume energy in a manner that ensures highest possible energy efficiency at a given level of cost. Actions to convince consumers to reduce energy consumption e.g. by appropriate measurement of use as well as precise information on bills, legible by the consumer.
Effectiveness **(indicators)**	Number of persons reached by information campaigns. Number of information projects undertaken by manufacturers and retail outlets regarding energy saving domestic equipment. Improved methods for monitoring market changes and innovative ideas emerging in order to accelerate market changes, particularly as regards equipment with the greatest potential for improving energy efficiency. Increased consumer interest in energy efficiency labels, increased visibility of labels and improved legibility of the information contained in them. Number of old inefficient items of domestic equipment exchanged for new energy saving equipment. Progress in the areas of design, production, use and disposal of domestic equipment.

Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2016 – ongoing process.

3.2 Energy efficiency improvement measures in the services sector

3.2.1 Overview table of energy efficiency improvement measures in the services sector

No.	Planned energy efficiency improvement measures	End-use energy efficiency improvement action targeted	Duration
1	Increase proportion of energy saving products available	Set minimum energy efficiency requirements for new products sold that consume energy (implementing Directive 2005/32/EC)	2008 to 2016 – ongoing process
2	Programme of economic energy consumption in the public sector	State administration to undertake energy saving measures in order to provide an example	2008 to 2016 – ongoing process
3	Promotion of energy services carried out by ESCO	Stimulating the market for energy services companies (ESCO)	2009 to 2016
4	2007 –2013 Infrastructure and Environment Operations Programme and Regional Operations Programmes	Financial support for measures reducing energy consumption in the public sector	2008 to 2013
5	Grant from the Global Environment Facility (GEF) – Energy Efficiency Project	Financial support for enterprises in the area of energy efficiency modernisation of buildings, district heating systems and heating networks.	2005 to 2011

3.2.2 Description of individual energy efficiency improvement measures in the services sector

Title	**1. Increasing the proportion of energy saving products available in the market**
Category	*Compulsory regulations* – technical standards, targeted information campaign
Area	Nationwide
Target group	Products and services sector: entrepreneurs, manufacturers, trade and business chambers, sales outlets, distributors, wholesalers, consumers, market analysts, energy agencies.
Priority measures	Information campaigns aimed at replacing inefficient products with energy saving products. Actions aimed at changing the market for products consuming electricity,

	that have been identified as setting the greatest challenge as regards energy savings: e.g. white goods, office equipment, lighting, electric motors, small electronic equipment. Voluntary agreements, procedural codes between suppliers with manufacturers, wholesalers and retail outlets, and, as regards consumers, chiefly with public authorities and large groups of consumers. Provision of independent testing of equipment in order to build confidence in labelling and energy efficiency requirements. Creation of large consumer groups in order to reduce the impact of the costs associated with the introduction of new technology. Training of technicians responsible for the installation and maintenance of energy consuming products.
Effectiveness **(indicators)**	Implementation of results of analyses as regards energy efficiency carried out by manufacturers, linked with new investment in energy saving equipment. Number of new voluntary undertakings made by outlets, distributors and buyers. Increase in volume of sales of energy saving products. Number of persons reached by information campaigns. Number of information measures taken by manufacturers and retail outlets as regards energy saving products. Number of trained salespeople, installers and personnel involved in equipment maintenance. Improved methods for monitoring changes in the market and innovative ideas emerging in order to accelerate market changes, particularly as regards products with the greatest energy efficiency potential.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2016 – ongoing process.

Title	**2. Economic energy management programme in the public sector**
Category	*Exemplary role of public sector*
Area	Nationwide
Target group	Public sector: public sector bodies, including national and local administration authorities, schools, hospitals etc, energy agencies.
Priority measures	Obligation on the state administration to take energy saving measures in the context of fulfilling its exemplary role. Actions to support the use of energy saving equipment and installations that constitute fittings in public sector buildings (offices, schools, hospitals, etc). Take into account the criterion of energy efficiency in public investment projects. Raise awareness among public sector employees as regards reduced energy consumption. Change street lighting and installation of new low-energy lighting. Training for public sector employees in energy efficiency and energy saving behaviour.

	Actions to promote exchange of best practice between individual units in the public sector as regards public procurement.
Effectiveness (indicators)	Agreements between various units of state administration involved in implementing Directive 2006/32/EC. Input worked out in the context of participating in European Union programmes to support the exchange of best practices as regards improvement in energy efficiency in the public sector. Information as regards steps taken by the public sector, and results achieved, made available to the public. Reports submitted by public sector organisations to the supervising and monitoring body, detailing action taken and results achieved. Number of machines and office equipment purchased by the public sector that are in the highest energy efficiency category that can be justified economically. Number of trained public sector employees, assessment of the impact of training from the point of view of the persons included in it. Information about the results of the measures implemented by the public sector published through the media, websites, information boards (including multimedia displays) etc.
Status of implementation **Timeframe**	New measures, implementation not yet initiated; 2008 to 2016 – ongoing process.

Title	**3. Promotion of energy services provided by ESCOs**
Category	*Energy services*
Area	Nationwide
Target group	Public sector: public sector organisations, including bodies from both state and local administration, schools, hospitals, etc. Products and services sector: ESCO companies, entrepreneurs, chambers of commerce and trade, sales outlets, distributors, wholesalers, consumers, market analysts, energy agencies and financial institutions.
Priority measures	Stimulate market for ESCOs providing energy services, and whose payment is based in whole or in part on the energy savings achieved. Ensure that end users obtain competitive energy services as a measure that supports effective implementation of Directive 2006/32/EC. Development and promotion of appropriate financial mechanisms for projects relating to energy efficiency. Measures to promote the growth of ESCO type companies, i.e. raising awareness, developing confidence in the activities of these companies and creating a list of the companies. Actions to develop appropriate projects for the qualification, accreditation and certification of suppliers of energy services, and energy audits as well as improved methods for the measurement of energy efficiency. Actions changing the energy consumption profile and leading to increased demand for energy services. Actions aimed at identifying and removing barriers in national regulations as regards the functioning of ESCO type companies. Actions to identify, analyse and exchange best practice as regards financial mechanisms for the improvement of energy efficiency.

Effectiveness (indicators)	Concrete examples of benefits as regards improved energy efficiency resulting from the implementation of Directive 2006/32/EC. Monitoring and checking of progress in achieving improvements in energy efficiency. Analysis of the effectiveness of different models for the implementation of improvements in energy efficiency with the help of the ESCO formula. Guidelines for the audit and public procurement system. Increased confidence in energy contracting and ESCOs. Evidence of improved market conditions for the development of ESCO companies.
Status of implementation **Timeframe**	New measure, implementation process not yet initiated; 2009 to 2016

Title	**4. 2007 – 2013 Infrastructure and Environment Operations Programme and the Regional Operations Programme.**
Category	*Financial support from public funds.*
Area	Nationwide
Target group	Public sector: public sector organisations, including bodies from both state and local administration, schools, hospitals, etc. Non-governmental organisations, churches and other faith denominations.
Priority measures	Financial support for projects relating to the energy efficiency modernisation of public buildings and for exchanging the equipment in these buildings for energy saving equipment. Full financing for the preparation of the complex documentation required to apply for and implement undertakings under this measure. Actions to support energy efficiency modernisation projects for public buildings under regional operations programmes.
Effectiveness (indicators)	Number of facilities undergoing energy efficiency modernisation. Amount of energy saved as a result of the implementation of energy efficiency modernisation projects. Monitoring and checking of progress in achieving energy efficiency improvements resulting from the implementation of Directive 2006/32/EC.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2013

Title	**5. Grant from the Global Environment Facility (GEF) – Energy Efficiency Project**
Category	*Financial instruments* – grants
Area	Nationwide

Target group	Entities carrying out energy saving investments in the area of energy efficiency modernisation of buildings, district heating systems and heating networks, i.e. incorporated bodies, local government, cooperatives and ESCOs.
Priority measures	Financial support for investments in the area of energy efficiency modernisation of buildings, district heating systems and heating networks with a long (10 year) payback period carried out in the Małopolska voivodship by the Przedsiębiorstwo Oszczędzania Energii ESCO sp. z o.o. in Krakow. Security for repayment guarantees for loans granted by commercial banks working with the Bank Gospodarstwa Krajowego for energy saving projects in buildings, district heating systems and heating networks. Financing for technical assistance for project support and monitoring.
Effectiveness (indicators)	Number of facilities undergoing energy efficiency modernisation. Number and value of repayment guarantees for loans granted by commercial banks working with the Bank Gospodarstwa Krajowego for energy saving projects. Amount of energy saved as a result of the implementation of energy efficiency modernisation projects.
Status of implementation **Timeframe**	Earlier measures having a long-term effect; 2005 to 2011.

3.3 Energy efficiency improvement measures in the industry sector (excluding installations covered by the EU emissions trading scheme).

3.3.1 Overview table of all energy efficiency improvement measures in industry

No.	Planned energy efficiency improvement measures	End-use energy efficiency improvement action targeted	Duration
1	Promotion of high efficiency cogeneration (CHP)	Support for the growth of high efficiency cogeneration through obligation imposed on electricity providers as well as support mechanisms.	2007 to 2016 – ongoing process
2	System of voluntary undertakings in industry	Undertaking by decision makers in industry to implement measures resulting in increased energy efficiency in their companies	2009 to 2016 – ongoing process
3	Development of energy management system and an energy audit system for industry	Raising the qualifications and skills of employees involved in the management of energy, equipment and staff in industrial facilities and carrying out energy audits in industry.	2008 to 2016 – ongoing process

4	2007 – 2013 Infrastructure and Environment Operations Programme and Regional Operations Programme	Financial support for actions relating to high-efficiency electricity generation and the reduction of losses in electricity distribution.	2008 to 2013
5	2007 – 2013 Infrastructure and Environment Operations Programme and Operations Programme	Support for enterprises for the introduction of best available technologies (BAT)	2008 to 2013

3.3.2 Description of individual energy efficiency improvement measures in industry

Title	**1. Promotion of high efficiency cogeneration (CHP)**
Category	*Support mechanism* – obligation imposed on electricity providers
Area	Nationwide
Target group	Power generation sector, state and local government bodies, industry, service companies, consumers, energy agencies, financial institutions, education system.
Priority measures	Introduction of a mechanism to obtain, cancel and trade in certificates confirming the generation of electricity using high efficiency cogeneration, resulting in energy savings. Obliging entities involved in the sale of electricity to end users, to obtain certificates relating to energy generated through cogeneration, to present them for cancellation and to obtain in exchange a specific number of certificates of origin (or make a substitution payment). Measures to support improvements in the process of energy generation from existing production methods as well as new production methods for electricity, heating and cooling. Measures to assist investments aimed at improving energy efficiency in industry e.g. by including projects involving high efficiency cogeneration in business plans. Incentives for investment in the growth of the cogeneration market, including coordination of measures and creation of a contact database for specialists, decision makers and main players in the field. Actions aimed at determining the requirement for heating and cooling that high efficiency cogeneration could fulfil.
Effectiveness (indicators)	Results of projects implemented, related to new investment in high efficiency cogeneration in industry, assessment of final impact. Keep a register of cogeneration certificates and information about cogeneration certificates issued and cancelled. Assessment of progress achieved in increasing the proportion of high efficiency cogeneration in the country's total electricity production. Analysis and monitoring of market growth and the proportion of

	electricity generated from high efficiency cogeneration, with information on customer profiles, prices and costs. Analysis of the use, impact and effectiveness of regional and national programmes supporting high efficiency cogeneration. Improved information on the distribution of cogeneration in markets, new installations, capacity for heat and cooling. Exchange of experience, best practice and the number of successful actions in spreading high efficiency cogeneration. Increased number of operators using high efficiency cogeneration, number of operators holding cogeneration certificates. Number of decision makers aware of the benefits of investing in the growth of high efficiency cogeneration.
Status of implementation **Timeframe**	New measure, implementation has begun; 2007 to 2016 – ongoing process.

Title	**2. System of voluntary undertakings in industry**
Category	*Voluntary undertaking*
Area	Nationwide
Target group	Industry sector, public sector, central and local government bodies, entrepreneurs, market analysts, energy agencies, financial institutions.
Priority measures	Actions relating to the introduction of a system of voluntary undertakings leading to improved energy efficiency in industry, agreed between state administration bodies and businesses. Description of the principles and conditions under which a business undertakes, in a given timeframe, to implement measures resulting in improved energy efficiency in their works. Description of precise goals and guidelines for reporting and monitoring, as required under the voluntary undertaking framework. Awarding businesses specific benefits such as additional *white certificates*, audit and expert support, reduced payments for use of environment etc. for fulfilling the conditions of the voluntary undertaking. Selection of a state administration body to act as a Party to the voluntary undertakings and that will monitor projects implemented and act as the system's coordinator. Obliging decision makers in industry to carry out measures resulting in improved energy efficiency in their companies. Actions to encourage decisions makers in industry to improve their companies' energy efficiency and to provide information on their achievements to their customers and suppliers. Introduction of financial incentive mechanisms to support a change in the market to increase the proportion of energy saving equipment, e.g. the PEMP programme which supports the development of energy saving electric motors.
Effectiveness **(indicators)**	Number of voluntary undertakings concluded with companies, industrial manufacturers, manufacturers' associations, etc. Number of undertakings and specific action plans aimed at increasing

	energy efficiency from decision makers in industry. Improved methods for monitoring market changes and innovative ideas appearing in order to accelerate change in the market, particularly as regards products with the greatest energy efficiency potential. Increased energy efficiency in industry, particularly among small and medium sized enterprises, improving their competitiveness as well as their image. Implementation of findings of analyses into energy efficiency carried out by manufacturers in relation to new investments in energy saving equipment.
Status of implementation **Timeframe**	Action planned. 2009 to 2016 – ongoing process.

Title	**3. Development of an energy management system and an energy audit system for industry.**
Category	*Information measures* – energy audit, training and education
Area	Nationwide
Target group	Industry, public sector, central and local government administration bodies, entrepreneurs, market analysts, energy agencies, financial institutions, chambers of commerce, education system, mass media.
Priority measures	Improving the qualifications and skills of workers who manage energy, equipment and personnel in industry. Carrying out energy audits in selected industrial premises in order to assess the potential for improving the energy efficiency of those premises. Measures to raise the awareness and skills of those who manage energy and equipment as well as personnel in industry. Development and promotion of simple and free of charge energy management tools that are suitable for industry including energy audit tools and benchmarking. Introduction of training programmes in energy management for technical and management staff in industrial premises. Provision of advisory services and information about the potential of reducing energy consumption in industrial premises. Measures to simplify exchange of know-how and experience between workers who manage energy, equipment and personnel in industrial premises. Measures aimed at promoting the creation of public/private energy efficiency funds as well as financial packages for industry for energy audits and investments to improve energy efficiency.
Effectiveness **(indicators)**	Number of energy audits carried out in industrial premises. Analysis of the take-up, impact and effectiveness of the programmes, standards and procedures for carrying out energy audits in industry. Progress achieved in raising qualifications and skills among workers managing energy, equipment and personnel in industrial premises.

	Increased awareness among decision makers involved in industry, informing decision-makers about the financial benefits associated with improved energy efficiency. Preparation and publication of handbooks on energy management systems in industry as well as training materials. Number/list of new ideas for energy efficient procedural and regulatory methods in industry. Number of undertakings given by decision-makers to carry out specific measures in order to improve the energy efficiency of their companies. Number of large-scale training courses for technical and managerial staff at industrial premises, and which can be repeated on a cyclical basis for different groups of participants. Number of trained energy management personnel, as well as staff involved in servicing equipment , number and quality of new contact networks.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2016 – ongoing process.

Title	**4. 2007 to 2013 Infrastructure and Environment Operations Programme and Regional Operations Programme**
Category	*Financial support from public funds*
Area	Nationwide
Target group	Entrepreneurs, local government units, entities providing public services on the basis of contracts concluded with local government units.
Priority measures	Financial support for investments related to the modernisation and construction of high efficiency energy generation facilities, including: - Construction or modernisation of facilities generating combined electricity and heat in accordance with the high efficiency cogeneration requirements described in Directive 2004/8/EC, - Replacement of heat generation facilities with combined energy generation facilities in accordance with the high efficiency cogeneration requirements described in Directive 2004/8/EC, - Preparation of the detailed documentation required to apply for and carry out projects (feasibility study, environmental impact assessment, technical documentation). Financial support for investment for reducing energy losses occurring during the distribution of electricity and heat, including : - Extension or modernisation of high, medium and low voltage distribution networks in order to reduce network losses, - Construction of new heating networks and heating distribution centres, and modernisation of existing ones through the application of energy saving techniques and solutions, - Preparation of the detailed documentation required for applying and implementing the projects (feasibility study, environmental impact assessment, technical documentation).
Effectiveness **(indicators)**	Number of combined heat and power plants constructed. Number of rebuilt combined heat and power plants. Electrical capacity installed. Amount of thermal energy generated.

	Amount of fuel saved. Length of electricity distribution network constructed. Length of electricity distribution network rebuilt. Number of transformers constructed. Number of transformers rebuilt. Length of district heating network constructed. Length of district heating network rebuilt. Change in the level of electricity loss during distribution. Change in the level of heat loss during distribution.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2013

Title	**5. 2007 to 2013 Infrastructure and Environment Operations Programme**
Category	*Financial support from public funds*
Area	Nationwide
Target group	Companies subject to the provisions of Directive 96/61/EC concerning integrated pollution prevention and control.
Priority measures	Financial support for investment in the area of implementation of best available technologies (BAT), enabling companies to comply with the requirements of Directive 96/61/EC concerning integrated pollution prevention and control as regards: - Changes in technology resulting in a reduction in the consumption of energy, water or raw materials, with particular attention to the secondary use of waste energy as well as the elimination of waste creation, - Changes in technology aimed at reducing emissions of certain substances and energy to the levels set out in national and EU legislation as well as BAT reference documents.
Effectiveness **(indicators)**	Number of investments in companies in the area of implementation of best available technologies (BAT). Reduced energy consumption by companies. Use of waste energy by companies Changes in companies' use of water.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2008 to 2013

3.4 Energy efficiency improvement measures in the transport sector (excluding air and sea transport)

3.4.1 Overview table of all energy efficiency improvement measures in the transport sector

No.	Planned energy efficiency improvement measures	End-use energy efficiency improvement action targeted	Duration
1	Introduction of management systems for traffic and transport infrastructure	Measure aimed at improving energy efficiency in transport through planning and coordinating traffic management and transport infrastructure.	2008 to 2016 – ongoing process
2	Promotion of sustainable transport systems and efficient use of fuel in the transport sector.	Measures to promote the introduction of energy saving means of transport and ecological transport methods.	2008 to 2016 – ongoing process

3.4.2 Description of individual energy efficiency improvement measures in the transport sector

Title	**1. Introduction of management systems for traffic and transport infrastructure**
Category	*Information measure* – information centres, targeted information campaigns, training and education. *Financial support from public funds*
Area	Nationwide
Target group	Transport sector, carriers, vehicle fleet operators, transport agencies, central and local government bodies, the education system, and mass media.
Priority measures	Organise management of and simplify access to information for carriers. Reduce excessive requirement for transport. Measures aimed at increasing the attractiveness and use of rail transport, including financial support from public funds under the 2007-2013 Infrastructure and Environmental Operations Programme. Promotion of intermodal transport, including financial support from public funds under the 2007-2013 Infrastructure and Environment Operations Programme. Management of urban traffic, the so-called *green wave.* Setting concrete measures and an integrated strategy for ecological city transport and for freight transport within towns; this includes establishing appropriate management mechanisms and organisational structures. Support for intelligent transport systems. Simplify access to information concerning energy efficiency in transport, as well as making this information available in pro-active and innovative ways to selected target groups. Create areas with restricted or regulated access for transport users. Run information campaigns addressed at different target groups concerning increasing energy efficiency in transport.
Effectiveness (indicators)	Number of new market participants who promote and use fixed measurements for energy efficiency in transport. Number of exemplary measures relating to the transfer of knowledge and experience as regards energy efficient transport. Examples of benefits resulting from planning and coordinating traffic

	management for energy efficiency in transport. Impact of promotional activities on the number of people that they reached, and, if possible, categorisation of target groups. Number of key market participants identified and examples of regulations used to increase energy efficiency in transport. The transfer, use and promotion of best practice, strategies and technologies. Number of information campaigns addressed to different target groups regarding increased energy efficiency in transport.
Status of implementation	New measure, implementation not yet initiated;
Timeframe	2009 to 2016 – ongoing process.

Title	**2. Promotion of sustainable transport systems and efficient use of fuel in transport.**
Category	*Information measure* – targeted information campaigns, training and education; *Compulsory regulations* - standards and norms
Area	Nationwide
Target group	Transport sector, vehicle manufacturers, companies using vehicles, drivers' associations, transport agencies, central and local government bodies, the education system, and mass media.
Priority measures	Preparation of urban plans for sustainable transport. Offer alternative means of transport, integration of public transport, *park and ride* type options. Develop a system of payments for the use of the environment, dependent on the quantity of fuel used and the type of engine in the vehicle, taking into consideration the engine's year of manufacture and compliance with successive EU norms. Measures aimed at increasing safety for pedestrians and cyclists. Planning best transport options for institutions, schools, local authorities, residential areas, etc. Provide training to drivers on energy efficiency when driving vehicles. Promotion of energy saving means of transport and ecological methods of travel, particularly over long distances. Introduction of energy efficiency standards and labels in order to promote energy saving means of transport. Encourage car-pooling and life-styles that are less dependent on cars. Promote tyre pressure checking. Education for children and young people, as also teachers, about the consequences of choosing specific means of transport. Run innovative information campaigns for travellers. Raise awareness among various target groups as to the effects on energy of the means of transport that they choose to use.

Effectiveness (indicators)	Analysis of the effects of promotional activities on the people reached and, if possible, categorisation of target groups. Amount and differentiation of payments for use of the environment, with regard to vehicles with combustion engines. Number of actions relating to the transfer of knowledge and experience in the area of sustainable transport, evaluate the potential of repeating these activities and implementation of best practice. Number of pilot projects regarding the use of energy efficiency standards and labels used to promote energy saving means of transport. Number of information campaigns addressed at travellers as regards optimum travelling methods. Changes in the behaviour of the travelling public as regards the means of transport they choose to use as a result of information campaigns carried out. Availability of intelligent technologies enabling the introduction of energy efficient means of transport. Analysis of the effects and effectiveness of the use of energy efficiency standards and labels to promote energy saving means of transport.
Status of implementation **Timeframe**	New measure, implementation not yet initiated; 2009 to 2016 – ongoing process

4 Horizontal issues

4.1 Overview table of horizontal energy efficiency improvement measures

No.	Planned energy efficiency improvement measures	End-use energy efficiency improvement action targeted	Duration
1	System of white certificates	Introduction of a support mechanism in the form of so-called *white certificates* to stimulate energy saving actions together with an obligation placed on suppliers of electricity, heat or gas fuels to end users.	2009 to 2016 – ongoing process
2	Information campaigns, training and education in the area of energy efficiency improvements	Organising and running information campaigns and educational projects on energy efficiency and financial support for actions relating to the promotion of energy efficiency.	2008 to 2016 – ongoing process

4.2 Description of individual horizontal energy efficiency improvement measures

Title	**1. System of white certificates**
Category	*Support mechanism* – system of so-called white certificates involving an obligation placed on suppliers of electricity, heat or gas fuels to end-users.
Area	Nationwide
Target group	Energy sector, industry, central and local government bodies, ESCO companies, energy agencies, market analysts and financial institutions.
Priority measures	Introduction of a mechanism for obtaining, cancelling and trade in certificates confirming action has been taken to save energy, as a mechanism to promote energy saving behaviour. Setting out a detailed list of energy saving measures resulting in: improved efficiency in energy generation, reduced losses in the sending and distribution of energy together with energy savings by end users, together with an appropriate number of white certificates. Obliging entities involved in the supply of electricity, heat or gas fuels to end users to obtain and present for cancellation a specific number of white certificates. Encouragement for investment to develop the energy services market, including project coordination and the creation of a contact database for specialists, decision makers and main players in this market.
Effectiveness (indicators)	Keep a register with information about the number of white certificates issued and cancelled, confirming that measures have been taken resulting in specific energy savings. Analysis of the growth of the white certificate market, to include prices, demand and requirements for the provision of energy services. Number of decision makers aware of the benefits of investing in the growth of the energy services market.

	Results of measures carried out at end users, relating to new investments that promote energy savings.
Status of implementation **Timeframe**	Action planned; 2009 to 2016 – ongoing process.

Title	**2. Information campaigns, training and education in the area of energy efficiency improvement.**
Category	*Information measures* – targeted information campaign, energy efficiency labelling, training and education. *Financial support from public funds.*
Area	Nationwide
Target group	Public sector, national and local government bodies, investors, entrepreneurs, energy agencies, chambers of commerce, the public, education system, mass media.
Priority measures	Run nationwide campaigns on efficient energy use. Organise and run information campaigns on the desirability of and savings from the use of the most energy efficient products. Financial support for measures relating to the promotion of energy efficiency from the fund for environmental protection and water management. Disseminate information on guidelines for sustainable development and support ecological means of transport using monies from the fund for environmental protection and water management. Support systems for measuring water and heat consumption using monies from the fund for environmental protection and water management. Develop and introduce new techniques and technologies particularly as regards efficient use of fuel. Information and education actions aimed at changing consumer behaviour and increasing social acceptance of solutions that improve energy efficiency. Encourage providers and consumers to pay more attention to energy efficiency labelling and to the energy consumption of products bought and sold. Training for sales staff as regards energy efficiency labelling and product life cycle costs. Creation of a training system for energy efficiency specialists within tertiary education, as part of various disciplines. Introduction of energy efficiency subjects into education programmes at all levels. Introduction of a training system for industry auditors in the area of energy management in accordance with CEN/CENELEC European standards. Continue auditor training as regards energy efficiency modernisation projects in construction. Energy efficiency training for technicians responsible for the installation and maintenance of energy consuming installations and equipment. Training for public sector employees in energy efficiency and energy saving behaviour. Provide training in energy management to technical and management

	staff in industrial premises. Information and education projects to encourage the exchange of know-how and best practice in the area of energy efficiency.
Effectiveness **(indicators)**	Number of persons reached by information campaigns. Number of information projects undertaken by manufacturers and retail sales outlets on energy saving products. Number of trained sales staff, installers and product maintenance personnel. Amount of money allocated by the fund for environmental protection and water management for measures relating to the promotion of energy efficiency. Number of entities that received financial support from the fund for environmental protection and water management. Increased sales of energy saving products. Improved methods for monitoring changes in the market and innovative ideas in order to be able to accelerate market changes, particularly as regards products with the greatest energy efficiency potential. Exchange of experience, best practice and the number of successful measures resulting in energy savings for the end-user. Increased level of awareness as regards the benefits of solutions with improved energy efficiency. Number of education projects on improving energy efficiency, and number of people involved. Number of organisations that include information on energy efficiency in their teaching programmes. Number of trained energy efficiency employees and experts, evaluation of the impact of information campaigns from the point of view of the persons who were reached by them.
Status of implementation	New measure, implementation initiated.
Timeframe	2008 to 2016 – ongoing process

5 Energy efficiency improvement measures required in accordance with Art. 5 and Art. 7 of Directive 2006/32/EC

5.1 Article 5 on measures in the public sector

Table presenting energy efficiency improvement measures as required by Art. 5 of Directive 2006/32/EC

Title	**Art. 5.1** Member States shall ensure that energy efficiency improvement measures are taken by the public sector, focussing on cost-effective measures that generate the largest energy savings in the shortest span of time.
Relevant energy efficiency improvement measures in the National Action Plan	Economic energy management programme in the public sector (see Table 3.2.1, item 2) Taking the energy efficiency criterion into consideration in public investments. 2007-2013 Infrastructure and Environment Operations Programme and Regional Operations Programmes (see Table 3.2.1, item 4) Energy efficiency modernisation of public buildings. Financial support for projects involving the energy efficiency modernisation of public buildings together with replacing old equipment with energy saving equipment.
Title of legislation or regulation	*Draft Energy Efficiency Act*
Date of entry into force	May 2008

Public sector organisations, including state administration bodies and local government units, schools and hospitals etc will fulfil an exemplary role as regards economic energy management, and the public will be informed about measures implemented and results obtained.

In particular, central and local state administration authorities as well as local government bodies will be obliged to estimate the amount of energy they use over the course of a year and to achieve energy savings at a level that is not lower than the national energy savings target. The measures implemented by state administration and local government bodies as well as the results obtained will be the subject of reports submitted to the *supervisory and monitoring body* which will supervise how this obligation is fulfilled.

A detailed catalogue of measures will be set out, and the state administration will be obliged to implement them as part of its exemplary role as regards economic energy management and the realisation of the national energy saving target.

For example, this catalogue could include the following measures:

- carry out energy audits and implement cost effective recommendations made in them,
- acquire or rent energy efficient buildings or parts of them,
- Equip own or rented buildings with energy efficient equipment.

The criterion of maximum energy efficiency for a specific level of cost will be used in investments realised by units in the public sector.

5.2 Article 7 – Ensuring availability of information

Table presenting measures to ensure availability of information as required under Art. 7 of Directive 2006/32/EC

Title	**Art. 7.1** Member States shall ensure that information on energy efficiency mechanisms and financial and legal frameworks adopted with the aim of reaching the national indicative energy savings target is transparent and widely disseminated to the relevant market sectors.
Relevant measures in the National Action Plan	*Exemplary role of the public sector* (see Table 3.2.1, item.2) *Information measures* (see Table 4.1. item 2)
Title of legislation or regulation	*Draft Energy Efficiency Act*
Date of entry into force	May 2008

Title	**Art. 7.2** Member States shall establish appropriate conditions and incentives for market operators to provide more information and advice to final customers on energy end-use efficiency.
Relevant measures in the National Action Plan	Promotion of ESCO services (see Table 3.2.1, item 3) *Support mechanism* – system of white certificates (see Table 4.1. item 1)
Title of legislation or regulation	*Draft Energy Efficiency Act*
Date of entry into force	May 2008

The draft *Energy Efficiency Act* provides for the introduction of measures that will ensure availability of information as required by Art. 7 of Directive 2006/32/EC.

A government organisation will be designated as responsible for:

- supervision over and evaluation of the way that the state administration fulfils an exemplary role as regards economic energy management and which, through the

services – for example – of the media, website and information displays, will inform the public about the combined effects of the measures undertaken,

- exchange of best practices in this area between organisations in the public sector.

In addition a *supervisory and monitoring body* will be formed to monitor the measures taken to fulfil the national energy savings target.

One of the responsibilities of the body will be to ensure that interested entities have access to up-to-date information about the workings of the white certificate system, about voluntary undertakings and other support mechanisms.

In particular the *supervisory and monitoring body* will also be charged with supporting, supervising and monitoring energy services as well as other measures serving to improve energy efficiency (this includes services as regards the provision of information and advice to end customers).

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Annex to the National Energy Efficiency Action Plan (NEEAP)

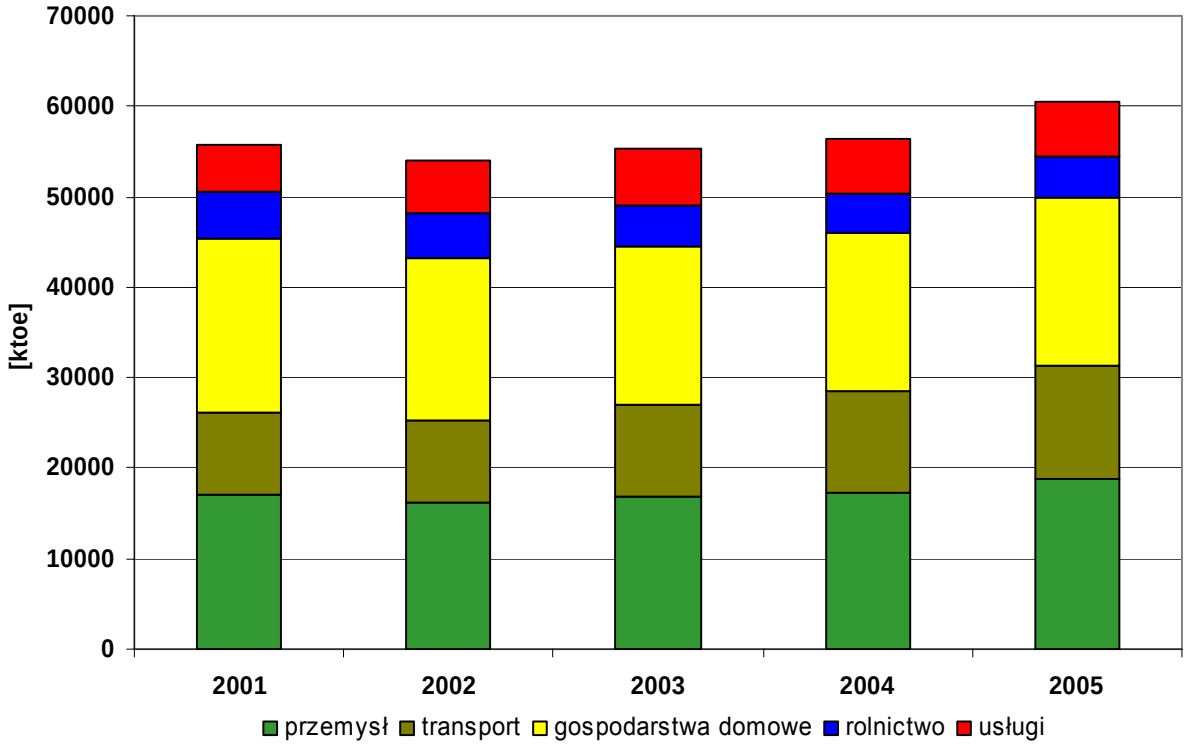
Calculation of the national energy savings target - methodology

Table 1 (Figure 1) presents data concerning energy consumption in Poland for the years 2001-2005, i.e. for the period required under Directive 2006/32/EC.

Table 1. Final energy consumption in Poland by sector [in ktoe and in GWh]

Final energy consumption [ktoe]	2001	2002	2003	2004	2005	Average final energy consumption in the years 2001 –2005
Industry	16 979	16 198	16 759	17 290	18 730	17 191
Transport	9 161	8 982	10 150	11 299	12 677	10 454
Residential buildings	19 212	18 092	17 663	17 414	18 573	18 191
Agriculture	5 162	4 885	4 424	4 434	4 489	4 679
Services	5 296	5 856	6 242	6 019	5 979	5 878
Total final energy consumption	55 810	54 013	55 238	56 456	60 448	**56 393**

Final energy consumption [GWh]	2001	2002	2003	2004	2005	Average final energy consumption in the years 2001 –2005
Industry	197 466	188 383	194 907	201 083	217 830	199 931
Transport	106 542	104 461	118 045	131 407	147 434	121 580
Residential buildings	223 436	210 410	205 421	202 525	216 004	211 561
Agriculture	60 034	56 813	51 451	51 567	52 207	54 417
Services	61 592	68 105	72 594	70 001	69 536	68 361
Total final energy consumption	649 070	628 171	642 418	656 583	703 011	**655 851**



przemysł = industry gospodarstwa = residential buildings rolnictwo = agriculture usługi = services

Figure 1. Final energy consumption in Poland by sector in the years 2001-2005

It was necessary to make precise calculations for energy consumption in the installations exempted from Directive 2006/32/EC under Annex 1 to Directive 2003/87/EC. These were based on information collected by NAEATS during monitoring over the emissions trading scheme.

For the statistical purposes required by Directive 2006/32/EC, existing data collection systems were used as much as possible, such as GUS [Central Statistical Office], URE [Energy Regulatory Office], industry agencies and associations and these were modified if necessary.

For the requirements of this report estimates were made of the level of energy consumed in installations included in the emissions trading scheme on the basis of 2005 data collected by NAEATS for the requirements of monitoring the emissions trading scheme.

Data about energy brought in as fuel in 2005 by installations included in the emissions trading scheme are broken down by type of installation (Table 2)

	Type of installation	GJ	ktoe	GWh
1.	Fuel combustion facilities with a nominal heat output of over 20 MW, excluding facilities burning dangerous or communal waste.	1 923 758 652	45 948	534 377
2.	Oil refineries	36 435 210	870	10 121
3.	Coking plants	21 375 432	511	5 938
4.	Installations producing primary or secondary iron or steel, including continuous casting, with a production capacity of over 2.5 MT/hour.	35 448 193	847	9 847
5.	Facilities producing cement clinker in rotary kilns, with a production capacity of over 500 MT/day.	35 050 797	837	9 736
6.	Lime production facilities with a production capacity of over 50 MT/day.	9 377 630	224	2 605
7.	Glass and glass fibre manufacturing facilities, with a production capacity of over 20 MT of molten glass/day	43 325 866	1 035	12 035
8.	Ceramics manufacturing facilities using firing, with a daily production capacity of over 75 MT, kiln volume of over 4 m^3 and density of over 300 kg of product per m^3 of kiln.	37 522 415	896	10 423
9.	Paper and cardboard manufacturing facilities with a production capacity of over 20 MT/day	4 458 831	106	1 238
10.	**Total**	2 146 753 026	51 274	596 320
11.	**Final energy consumption in the installations listed in Annex 1 to Directive 2003/87/EC***	**222 994 374**	**5 326**	**61 943**

Source: National Administrator of the Emission Allowances Trading System 2007

Table 2. Energy introduced in fuel in installations covered by the emission trading scheme in 2005.

**Final energy consumption in the installations listed in Annex I to Directive 2003/87/EC* was calculated as follows: total energy (item 10) less the energy introduced as fuel in fuel combustion facilities with a nominal heat output of over 20 MW (item 1)

Final energy consumption in Poland – total and excluding the installations covered by the EU emissions trading scheme is shown in Table 3.

Table 3. Final energy consumption in Poland 2001 – 2005 [in ktoe and in GWh]

Final energy consumption [ktoe]	2001	2002	2003	2004	2005	Average for 2001 – 2005
Total final energy consumption	55 810	54 013	55 238	56 456	60 447	56 393
Final energy consumption in the installations listed in Annex I to Directive 2003/87/EC						5 326
Final energy consumption excluding the installations listed in Annex I to Directive 2003/87/EC						51 067
Target of Directive 2006/32/EC (9% in year 9)						4 596
Final energy consumption [GWh]	2001	2002	2003	2004	2005	Average for 2001-2005
Total final energy consumption	649 070	628 172	642 418	656 583	703 011	655 851
Final energy consumption in the installations listed in Annex I to Directive 2003/87/EC						61 943
Final energy consumption excluding the installations listed in Annex I to Directive 2003/87/EC						593 908
Target of Directive 2006/32/EC (9% in year 9)						53 452

An intermediate target – a 2% indicative target – has been set for the third year that Directive 2006/32/EC is in force, which is 1020 ktoe. Estimated effects of the Thermo modernisation Act are 130 ktoe of the annual final energy saving. This means that to achieve the 2% indicative target will require a significant intensification of activities to improve energy efficiency and the introduction of new mechanisms to support energy efficiency improvements.

It is just such solutions and proposals for the introduction of new support mechanisms to stimulate and enforce energy saving actions that are presented in this National Energy Efficiency Action Plan (NEEAP).

The effects of earlier measures to reduce energy consumption in relation to achieving the indicative target.

Appropriately documented programmes and actions to improve energy efficiency, undertaken from 1991, will play an important part in the intensity of actions undertaken under the framework of Directive 2006/32/EC. According to Annex I to Directive 2006/32/EC:

'Energy savings in a particular year following the entry into force of this Directive that result from energy efficiency improvement measures initiated in a previous year not earlier than 1995 and that have a lasting effect may be taken into account in the calculation of the annual energy savings. In certain cases, where circumstances can justify it, measures initiated before 1995 but not earlier than 1991 may be taken into account. Measures of a technological nature should either have been updated to take account of technological progress, or be assessed in relation to the benchmark for such measures.'

This provision allows the possibility of including energy savings obtained from improvement measures introduced before Directive 2006/32/EC came into force in the indicative target. These improvement measures must however have a lasting effect – this means a result that can be shown in successive years when the Directive is in force and makes it possible to include certain measures in the calculation of the national indicative target.

In Poland energy efficiency modernisation of buildings has been taking place from 1999 with the help of monies from the Thermo modernisation Fund. This can be counted towards the indicative target in each year that the Directive is in force, since, in accordance with the provisions of Annex IV of the Directive, insulation of private dwellings has a lifetime of 30 years.