MINISTRY OF ECONOMY AND TRANSPORT

HUNGARY'S NATIONAL ENERGY EFFICIENCY ACTION PLAN (approved by the Government on 13 February 2008)

Compiled by: GKM
EK Kht.

Budapest, February 2008.

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1. Introduction

1.1. Positioning of the action plan

Directive 2006/32/EC of the European Parliament and the Council (ESD) requires Member States to prepare a National Energy Efficiency Action Plan (NEEAP).[*]
The present Action Plan outlines ongoing and planned energy efficiency measures which, through proper application at the required efficiency level, will make it possible to reduce Hungary's energy use by 1% per annum in the 9 years of the period between 2008-2016.
The Action Plan is an important instrument for Hungary to reduce energy use by 20% by 2020 in accordance with EU obligations and thereby assist a 20% reduction of greenhouse gas emission.

1.2. National goal setting and its target value

In accordance with the ESD Directive, Hungary will reduce its end energy use by 2016 to a total extent of 15,955 GWh/year (57.4 PJ/year). This objective corresponds to energy savings of 1,773 GWh (5.38 PJ) per annum.

The measures required to achieve this goal are summarised in Appendix I along with the energy savings achievable thereby.

In the course of working out the measures summarised in Tables 1 and 2 of the Appendix, we took into account the experiences and principles of the first national energy savings and action programme aimed at increasing energy efficiency launched by Govt. Resolution 2399/1995 (XII. 15.), the principles and experiences of the energy savings and efficiency strategy and action plan up to 2010 launched after Govt. Resolution 1107/1999 (X. 8.), and the experiences gained on the basis of energy efficiency-related tender application systems operating since 1991 with minor financial instruments.

Apart from the measures presented along with their quantitative effect, further energy savings opportunities are provided by those measures, the effects of which cannot be estimated in advance. Such opportunities were described in Chapter 4.4.2 of the Action Plan and such measures are represented by the green investment programme planned by the environmental department.

[*] In accordance with Directive 2006/32/EC of the EU, energy efficiency shows the effectiveness of the end use of energy; we are evaluating its improvement - irrespective of changes of economic circumstances - solely through energy savings.

Apart from the action plan based principally on investment aid - and in the interest of promoting the feasibility of the action plan - other instruments that international surveys have shown to be often effective should also be applied. Such measures are the following:

- deregulation of rules that lead to energy wastage,
- information campaigns (informing the public and increasing energy awareness),
- involvement of key sectoral stakeholders and companies in various actions related to energy efficiency,
- implementation of sample projects and their propagation (with the involvement of companies),
- widespread propagation of results achieved - e.g. renovation of prefabricated panel buildings, application of solar collectors.

The Directorate-General for Energy at the Ministry of Economy and Transport will be in charge of elaboration and monitoring of implementation of the National Energy Efficiency Action Plan. The activity of the Directorate-General will ensure that the National Energy Efficiency Action plan is fully harmonised with Hungary's energy policy and is represented in the latter with the proper emphasis.

For the tasks specified in Articles 4 and 5 of the Directive, the most suitable body is the Hungarian energy agency, Energy Centre Kht (Energia Központ Kht.), thus, the Directorate-General for Energy of the Ministry of Economy and Transport (GKM) intends to assign the implementation of tasks related to carrying out the National Energy Efficiency Action Plan to Energy Centre Kht.

1.3. Detailed system of objectives of the action plan

The primary objective of the action plan is to achieve the greatest level of savings in final energy use by efficient utilisation of available resources. Apart from the direct objectives of the planned measures, an indirect objective is to initiate a change in the way energy is viewed as a result of the examples of the relevant measures and thus develop awareness of the real value of energy. This change of view will have a feedback effect on the treatment of resources and will thus aid the achievement of environmental and climate protection goals.

The measurable goals of the action plan are scheduled as follows

Annual savings	Result [GWh/year]	Increment [GWh/year]	*Result [PJ/year]*	*Increment [PJ/year]*
2008	1000	1000	*3,6*	*3,6*
2009	2600	1600	*9,4*	*5,8*
2010	4400	1800	*15,8*	*6,5*
2011	6300	1900	*22,7*	*6,8*
2012	8300	2000	*29,9*	*7,2*
2013	10300	2000	*37,1*	*7,2*
2014	12300	2000	*44,3*	*7,2*
2015	14150	1850	*50,9*	*6,7*
2016	15960	1810	*57,5*	*6,5*

Table 1: Amount and increment of annual savings

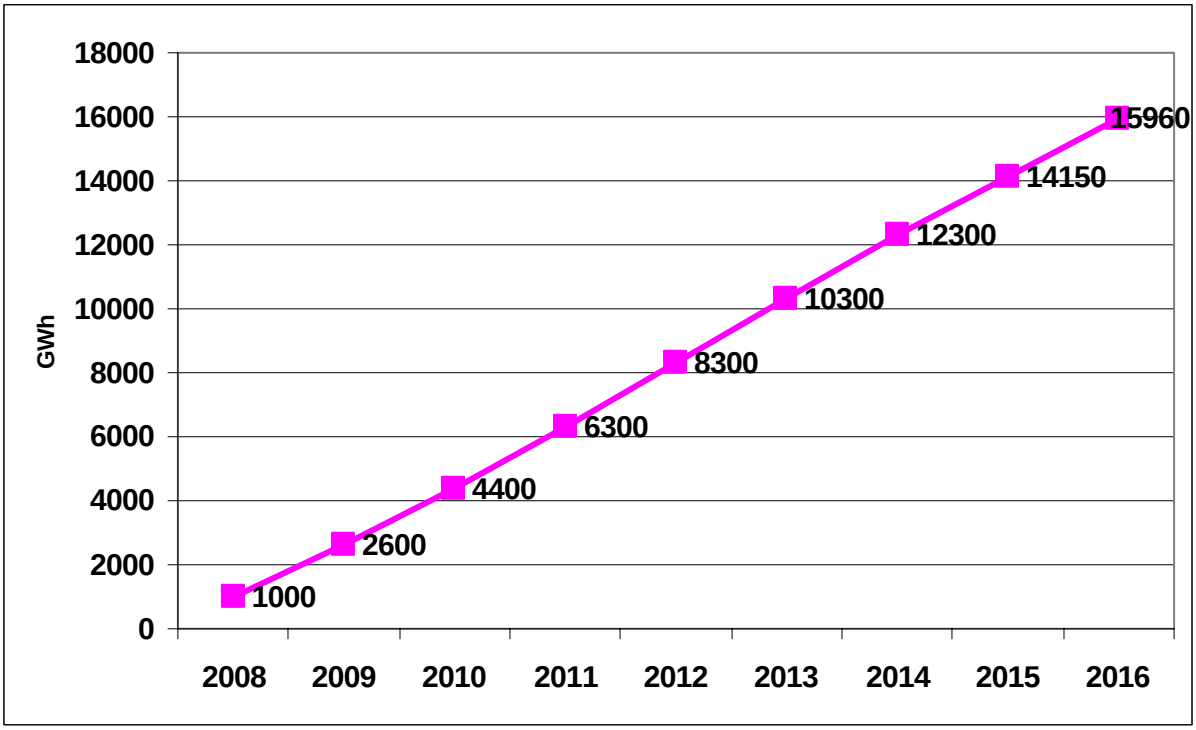

Figure 1: Planned cumulative energy savings in GWh/year

Since the legal background of several measures must be created in the course of 2008 and an introductory period is needed to make the measures known in the widest circles possible, we have assumed a continuous increase of savings results in the planning period of 2008-2016, the peak of which is 2,000 GWh/year (=7.2 PJ/year) annual savings.
The present Action Plan defines the partial objective of 2010 (2,600 GWh = 9.4 PJ) and the objective of 2016 (15,955 GWh = 57.4 PJ).
The date of review of the first Action Plan, i.e. the date of submission of the second Action Plan is 30 June 2011 and that of the third Action Plan is 30 June 2014.

1.4. Major areas of intervention

In order to achieve the objectives, we have identified the following major areas and sub-areas of intervention:

- buildings in the residential sector,
- buildings in the institutional sector,
- energy conversion,
- traffic, transportation
- construction (newly constructed buildings) and the
- typical energy-consuming product groups that can significantly influence the extent of energy demands

In these areas, proper regulation must be created in the major areas of products and uses, providing for the desired energy efficiency levels and procedures.

Through the provision of relevant information, energy consumers should be educated to engage in increased energy savings in order to take responsibility for sustainable development.

Simultaneously with the required measures, proper financing conditions must be provided by creation and application of economic incentives - aid, tax measures and legal provisions.

1.5. Major governmental and professional parties involved in implementation and their responsibilities

The system of objectives of the Action Plan is closely related to the National Climate Change Strategy, Hungary's Energy Policy, the New Hungary Development Plan and is related to Hungary's strategy aimed at increasing the use of renewable energy resources. The objective of the action plan and its measures is to mobilise public opinion and central government decision-makers as well as market participants in order to transform domestic energy utilisation in such a way as to put emphasis on energy-efficient buildings, installations and means of transport and to maximise the efficiency of energy supply. In order to achieve this, energy efficiency should be increased in all areas of energy production and utilisation .

The major governmental and professional parties involved in implementation are as follows:

ABBREVIATION	NAME	AREA OF RESPONSIBILITY	
GKM	MINISTRY OF ECONOMY AND TRANSPORT	ISSUES RELATED TO ENERGY AND ECONOMY	
IRM	MINISTRY FOR JUSTICE AND LAW ENFORCEMENT	ISSUES RELATED TO LEGISLATION AND ITS AMENDMENT	
KVVM	MINISTRY OF ENVIRONMENT AND WATER	ISSUES RELATED TO EMISSION TRADING AND ENVIRONMENTAL PROTECTION, GREEN INVESTMENT SYSTEM	
OKM	MINISTRY FOR EDUCATION AND CULTURE	ISSUES RELATED TO EDUCATION AND AWARENESS BUILDING	
ÖTM	MINISTRY FOR LOCAL GOVERNMENT AND REGIONAL DEVELOPMENT	ISSUES RELATED TO LOCAL GOVERNMENTS, REGIONAL DEVELOPMENT AND THE PANEL PROGRAM, AS WELL AS ENERGY CERTIFICATES	
GKM-PM	MINISTRY OF ECONOMY AND TRANSPORT - MINISTRY OF FINANCE	ISSUES RELATED TO FINANCIAL REGULATION AND ALLOCATION OF SUPPORT	
SZMM	MINISTRY FOR SOCIAL AND LABOUR AFFAIRS	ISSUES RELATED TO LABOUR (E.G. MANDATORY EMPLOYMENT)	
EK KHT.	ENERGY CENTRE KHT.	COORDINATION OF IMPLEMENTATION OF THE ACTION PLAN AND MONITORING	

		PROGRESS OF IMPLEMENTATION	
MFB	HUNGARIAN DEVELOPMENT BANK ZRT.	ISSUES RELATED TO FAVOURABLE DEVELOPMENT CREDIT SCHEMES	
MKEH	HUNGARIAN COMMERCIAL LICENSING OFFICE	ISSUES RELATED TO COMMERCE	
NFÜ	NATIONAL DEVELOPMENT AGENCY	ISSUES RELATED TO THE ELABORATION AND REVIEW OF THE NEW HUNGARY DEVELOPMENT PLAN (NHDP)	

Table 2: Major parties involved in implementation of the Action Plan

2. Major considerations of working out the National Energy Efficiency Action Plan, strategic harmonisation of the Action Plan

From the aspect of energy, Hungary is strongly dependent on import: more than three quarters of energy sources are imported. For all items of the triple system of objectives of Hungarian energy policy (see below), reduction of energy consumption is the best, fastest and most efficient solution. Sustainability must be especially emphasised among these goals, which is closely related to the ambitious CO_2 emission reduction goals projected within the National Climate Change Strategy. In addition, Directive 2006/32/EC of the European Parliament and the Council requires the Member States to prepare national energy efficiency action plans by 30 June 2007 by presenting medium-term energy efficiency actions and measures and guarantee the implementation of said measures, monitor their success and update their plans in accordance with results achieved.

The objective of the present document is to ensure the achievement of the above objectives and to implement legal harmonisation of the Directive 2006/32/EC.

2.1. Domestic background of the Action Plan

In Hungary, the legal basis of energy efficiency activity was created by Govt. Resolution 1107/1999 (X.8.), which projected an achievable energy savings amount of 75 PJ/year by 2010, specifying the degree of state subsidy required and the measures to be introduced.

2.2. Hungary's energy policy

The objectives of the Hungarian Energy Efficiency Strategy are in accordance with the main objectives of the framework strategy entitled "Energy Policy of Hungary 2007-2020", which are as follows:

1. **Strengthening competitiveness**
2. **Increasing the security of energy supply**
3. **Promotion of sustainable development**

Moreover, the National Energy Efficiency Action Plan creates harmony with the domestic and EU political initiatives serving energy efficiency and contributes to the utilisation of the most cost-effective energy savings potential. Moreover, the Action Plan is an important instrument of consumer awareness building, by which the market can be influenced for the purpose of long-term energy efficiency as well as a way of informing market participants on the structure and time horizon of plans.

The success of all these measures can be properly assessed on account of the implementation of EU Member States' expectations regarding energy efficiency and the achievement of climate protection objectives.

2.3. New Hungary Development Plan

The scope and time frame of the Action Plan (2008-2016) is in accordance with the period (2007-2015) of the New Hungary Development Plan (hereinafter: NHDP). In the Environmental and Energy Operative Programme (KEOP) of the NHDP, the constructions of a separate priority (5. priority axis) are engaged in increasing energy efficiency. Via the priority axes, in the 9-year period of the development plan, 38.2 billion HUF (154.37 million EUR) non-refundable investment support is available to tenderers. Support intensity in the programme may vary between 10% and 50%, the exact measure of which will be determined by calculating the financing shortage.
The centre of emphasis and method of interventions within the NHDP KEOP will be determined by the KEOP action plan to be reviewed every 2 years.
According to the current action plan, emphasis is placed in the programme on reducing energy consumption of company and public building, modernisation of the primary side of public lighting systems and distance heating systems, linking energy efficiency measures with the exploitation of renewable energy sources as well as improving the conditions of third party financing (ESCO).

2.4. Energy Efficiency Action Plan of the European Union

For the purpose of an integrated EU energy policy, the European Commission accepted the EU Energy Efficiency Action Plan in the autumn of 2006, which places special emphasis on the improvement of efficiency in the new Member States.
Moreover, it emphasises the importance of the introduction of new energy efficiency standards and minimum requirements in the area of energy consumption equipment and directs attention to the importance of reducing energy efficiency in the area of buildings and transportation.
Development of the energy-conscious conduct of consumers, improvement of the efficiency of energy production, transportation and distribution and international cooperation in the field of efficiency are all prominent areas in the EU action plan.
Strong support is given to the exchange of best solutions which for example can be an important instrument in improving the energy efficiency of cities where professionals who are not always aware of newest developments must arrange for the optimum solution for highly similar tasks.
The action plan directs attention to the necessity of working out financial mechanisms which promote the implementation of efficiency-related investments (e.g. ESCO, SME) as well as the elaboration of support elements which are also capable of increasing efficiency.

Influence of the EU Action Plan and adaptation of draft measures and guidelines set forth in it can be clearly observed in the present Action Plan.

3. Objectives to be implemented by the National Energy Efficiency Action Plan

For determination of the national target, the country's energy use subject to Directive 2006/32/EC had to be presented. The details of the latter - along with statistics according to national energy consumption sectors - are included in Tables 3 and 4 in Appendix F1.

The following table includes a summary of annual energy consumption values in terms of GWh as detailed in Appendix I:

	2002	2003	2004	2005	2006	
	Total	Total	Total	Total	Total	Five-year average
	GWh	GWh	GWh	GWh	GWh	GWh
Final energy consumption total	197 019	203 662	201 628	207 813	213 756	204 776
Consumption subject to emission trading	28 800	27 296	27 972	26 368	27 062	27 500
Consumption amount affected by the Directive	**168 219**	**176 366**	**173 656**	**181 446**	**186 695**	**177 276**
Population	70 733	78 752	72 011	73 262	75 725	74 097
Communal sector	36 981	37 474	37 927	40 061	39 804	38 449
Industry without CO_2 trading	13 422	13 091	13 352	12 399	12 778	13 008
Transportation	39 458	39 844	43 103	48 499	51 4745	44 476
Agriculture	7 624	7 204	7 262	7 224	6 914	7 246

Note: due to rounding, deviations of 1-2 GWh are possible in the additions.

Figure 2 depicts the increase of the amount of annual utilised energy subject to the ESD Directive in GWh. The dashed line indicates the average value of the last five years:

Figure 2: Hungary's final energy consumption subject to the ESD Directive, 2001-2006

Source: Energy Centre Kht.

Average of the last 5 years:	**177,276 GWh**	*638.2 PJ*
9% savings goal by 2016	**15,955 GWh**	*57.4 PJ*
Savings objective allocated:	**15,955 GWh**	*57.4 PJ*
Intermediate target value for 2010	**1,773 GWh**	*6.38 PJ*
		(rounded off: 6.4 PJ)

According to the methodology specified in Annex IV of Directive 2006/32/EC of the European Parliament and Council, the basis of projection of the 1% savings per year is a 5-year average of the final (direct) energy use, within which the sectors subject to emission trading need not be taken into account. The extent of achievement of the target value - apart from intermediate assessments stipulated in the Directive - are to be performed after the ninth year of introduction of the Directive. Energy savings are to be measured starting 1 January 2008 according to the Directive.
The above table presents the calculation of Hungary's national energy savings target. The energy savings goal amounting to 15,955 GWh will be realised by the country by 2016 - similarly to the other Member States - by a freely chosen scheduling scheme. Measurement of the achievement of target values - apart from intermediate assessments set forth in the Directive - will be performed after the ninth year of introduction of the Directive, according to a methodology specified in Annex IV of the Directive.
Details of the calculation are included in Annex 1 in PJ.

The sectoral distribution of final energy use involved in the energy savings expectations delivers the following picture:

Sector	PJ	GWh	%
Population	273	75 725	40
Communal sector	143	39 803	21
Industry without CO_2 trading	46	12 778	7
Transportation, traffic	185	51 474	28
Agriculture	25	6 913	4
Total	672	186 694	100

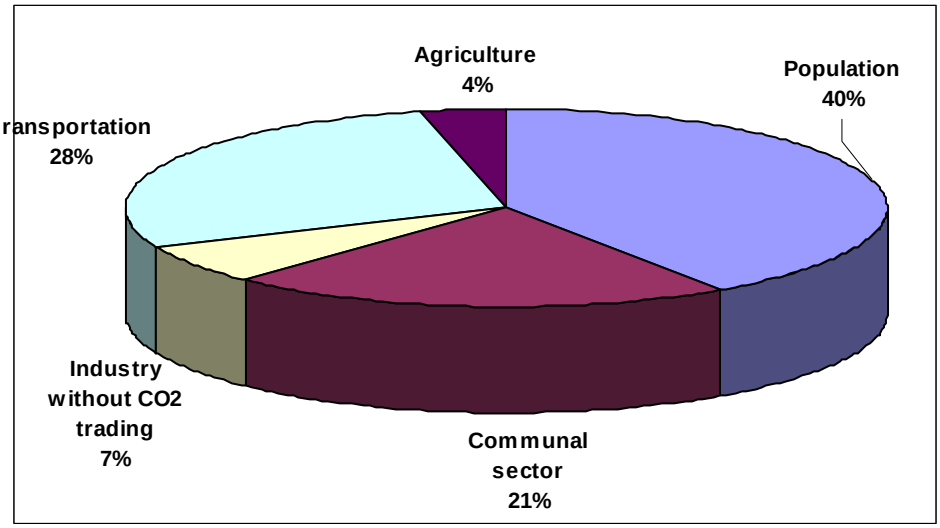

Figure 3. Sectoral distribution of final energy use in Hungary in 2006

In Hungary, the final utilisation subject to the ESD (in a 5-year average) is **177,276 GWh** (638.2 PJ).

The expectation regarding Member States imposed by the ESD - and at the same time, the domestic target value - is as follows:

- 1% per year energy savings: **1,773 GWh/year;** (6.4 PJ/year)
- total for the period 2008-2016 (9 years) **15,955 GWh** (57.4 PJ).

The target value of the national energy efficiency strategy on the average is 1,773 GWh (6.4 PJ) of energy carrier savings per year, which represents a total figure of 15,955 GWh (57.4 PJ) in the period between 2008-2016 (a detailed schedule is included in Item 1.3).

4. Sectoral energy efficiency measures

We took into account the results of energy efficiency determined in terms of primary energy carriers and GWh, in the event that those were manifest as electricity savings, due to a 31.3% efficiency of the Hungarian electricity system, by the relevant correction multipliers. Thus, in such cases, the actual electricity amount specified by a multiplier of 0.313 is already in compliance with the GWh energy savings specified as a target value. (This means that the targeted measure values presented for electricity savings are achieved in the event of actual electricity savings in the amount of the target value x 0.313 GWh.) In other cases, conversions must be performed by the heat equivalent of electricity (1 GWh = 3.6 TJ) in order to create a PJ value from the target value specified in GWh.

4.1. Residential sector

Summary table of measures planned in the residential sector:

No.	Measure	Action by end customers triggered by the measure	Duration	Planned savings by 2016 [GWh/year]
4.1.1.1	Support for energy-efficient modernisation of residential buildings built by industrialised technologies	energy-related modernisation of panel apartments	(2001-) 2008 - 2016	1.125
4.1.1.2	"For a Successful Hungary" residential energy savings assistance and credit programme (NEP assistance application system)	energy-related modernisation of traditionally built apartments	2008 - 2016	750-1.000
4.1.2.1	Application of individual measurement, miniature heat centres in distance heat supply	reduction of distance head demand	2008 - 2016	375
4.1.2.2	Development of the operation of an energy efficiency consultant network	promotion of energy-related modernisation	2008 - 2016	375
4.1.2.3	Energy-related certification of buildings	encouragement of energy-related modernisation	2008 - 2016	125-375
4.1.2.4	Periodic inspection of household boilers	encouragement of replacement and renewal of boilers	2008 - 2016	125-250
4.1.2.5	Energy efficiency labelling of household boilers	replacement of boilers and purchase of better efficiency boilers	2008 - 2016	75-125
4.1.2.6	Energy efficiency labelling of household electric and gas boilers	replacement of household machine, purchase of better efficiency machines	2008 - 2016	75-125
4.1.2.7	Provision of assistance	replacement of household	2008 - 2016	125-200

	for purchasing household cooling machines of special energy efficiency with an "A" label and household refrigerating machines of special energy efficiency with an "A" label and other household machines, by replacement of old appliances	machines, purchase of better efficiency machines		
4.1.2.8	Improvement of the propagation of energy-efficient lighting equipment (compact light tubes)	replacement of light fixtures	2008 - 2016	175-350
4.1.2.9	Working out energy efficiency-related training materials for application in primary and secondary education	creation of the basis for an energy-conscious conduct	2008 - 2016	25-125
	Total			**3.350- 4.425**

4.1.1. Further application of existing measures in the household sector

4.1.1.1 **Support for energy-efficient modernisation of residential buildings built by industrialised technologies**

Category: (3.1)
financial measures (non-refundable assistance)

Regional access: whole country

Target group: panel buildings in the household sector

End user target group households of those living in panel buildings

Description

Objective of the assistance
The objective of subsidy is the renovation of residential buildings constructed by industrialised technologies in a way that results in energy savings as well as modernisation and renovation of said residential buildings as well as their machine systems and equipment. From the aspect of the assistance application, the following can be regarded as residential buildings constructed by industrialised technologies: residential buildings constructed by the use of panel, block, tunnel-mould, cast wall, reinforced concrete skeleton and other prefabricated technologies.

Range of applicants
Applications may be submitted by condominiums and residential cooperatives by the energy saving renovations of buildings under their own ownership as well as by local municipalities for rental buildings under their ownership.

Manager of the assistance fund:
Ministry for Local Government and Regional Development

Major conditions of application
Assistance may be requested for the following works in the course of renovation of residential buildings constructed by industrialised technologies in a manner resulting in energy savings:

a) Subsequent heat insulation tasks:
   - insulation, replacement of doors and windows along with insulation of roofs and basement ceilings,
   - heat insulation of façades.
b) Modernisation and renewal (resulting in energy savings) of building engineering systems.
c) Utilisation of renewable energy sources in residential buildings.

Assistance available by application
The amount of requested state assistance may be 1/3 of the investment amount at most but not more than 500,000 HUF per apartment.
Cost sharing - if the local municipality approves of the modernisation - is as follows with regard to the renovation costs of the whole building:

- community municipality: 1/3 of the cost (if the local municipality does not approve of the modernisation , the residential community must cover this 1/3 amount, as well),
- owner(s): 1/3 of the costs (or 2/3 according to the previous case)
- central budget: maximum 1/3 of the cost, but may not exceed an amount of 500,000 HUF/apartment

Annual energy savings target	125 GWh/year; (0,45 PJ/year)
Nature and time scheduling of the measure:	From 1 February 2008, it operates under the new conditions (By April 2006, 118000 apartments had been modernised)
Responsible party:	Ministry for Local Government and Regional Development
4.1.1.2	**"For a Successful Hungary" residential energy savings assistance and credit program (NEP application system)**
Category:	(3.1 and 3.3) financial measure (non-refundable assistance and/or credit with a favourable interest)
Regional access:	whole country
Target group:	in the case of energy saving investments, buildings in the household sector not constructed by industrialised technologies • natural persons,

- residential cooperatives,
- condominiums (residential cooperatives and condominiums hereinafter collectively referred to as: residential community)

End user target group	residents belonging to the household sector and not living in panel buildings
Description	The objective of assistance is energy-related modernisation of apartments, reduction of residential energy use and mitigation of energy-related burdens of the population. Fund manager: Energy Centre Kht. Assistance in the form of non-refundable support or favourable loans can be granted to applicants submitting applications for the following modernisation objectives: • subsequent heat insulation of residential buildings (facades, attics, roofs and basements) constructed by traditional technologies prior to 1994 • subsequent heat insulation or replacement of doors and windows of residential buildings constructed by traditional technologies prior to 1994 • modernisation of existing heating and hot water supply systems of residential buildings constructed by traditional technologies and their replacement with energy-saving equipment • within the framework of the application, only the energy-related modernisation of residential houses, buildings, apartments, homesteads (hereinafter: residential property) constructed by traditional technologies may be supported
Annual energy savings target	83 -111 GWh/year; (0.3-0.4 PJ/year)
Nature and time scheduling of the measure:	Launched in 2007
Responsible party:	Ministry of Economy and Transport, Hungarian Development Bank

4.1.2. Planned energy efficiency measures in the household sector

4.1.2.1 Application of individual measurements, miniature heat centres in distance heat supply

Category:	(3.1, 3.3) Financial measure (non-refundable assistance and/or credit with a favourable interest)
Regional access:	whole country
Target group:	apartments receiving distance heating
End user target group	households of residents of apartments receiving distance heating

Description	Act XVIII of 2005 on distance heat supply makes possible the measurement of the amount of heat at the heat reception station apart from measurements at the heat centre. The quantity of utilised distance heat can also be measured for each individual apartment. The planned improvement of the heat centre measurement system (which can be currently regarded as general) involves the elaboration of regulation of the heating system per apartment and the measurement of heat quantity received per apartment. Apart from possibly resulting in a significant energy saving, this system will implement consumer costs proportional to the amount of service.
Annual energy savings target	42 GWh/year; (0.15 PJ/year)
Nature and time scheduling of the measure:	2008. II. half: elaboration of the assistance system required for development 2009. I. half: launching of the assistance system As a result of the measure, regulation and individual measurement can be implemented in 120 thousand apartments in the period between 2008 and 2011.
Responsible party:	Ministry of Economy and Transport Ministry for Local Government and Regional Development Hungarian Development Bank Zrt.

4.1.2.2 Development of the operation of an energy efficiency consultant network

Category:	(2.3 and 2.5) information, awareness building (information centres, education)
Regional access:	whole country
Target group:	household sector
End user target group	population
Description	A consultant organisation familiar with practical experiences and the opportunities for energy savings independent of energy suppliers plays an important role of shaping the energy conscious view of the population and in spreading knowledge about the opportunities and methods of application of energy savings. Apart from direct support of interested parties they are contracted by, the tasks of a consulting organisation include the organisation of training sessions, administration of campaigns, working out and disseminating printed matter, cooperating in various action plans aimed at energy savings coordination with civic organisation s that share the same goals in order to raise the knowledge of energy consumers, and improving the efficiency of initiatives aimed at energy savings.

Annual energy savings target	42 GWh/year; (0.15 PJ/year)
Nature and time scheduling of the measure:	Designation of the national energy agency (Energy Centre Kht.) for creation and operation of the system of an energy efficiency consulting network and provision of resources needed for performance of the relevant task.
Responsible party:	Ministry of Economy and Transport

4.1.2.3 Energy-related certification of buildings

Category:	(1.1) enactment of legislation (energy-related certification of buildings)
Regional access:	whole country
Target group:	Apartments or public buildings larger than 1500 m^2
End user target group	population and institutions
Description	Implementation of the provisions set forth in Directive 2002/91/EC of 16 December 2002 by the European Parliament and the Council, as a first part of which TNM Decree 7/2006 on specification of the energy-related characteristics of buildings was created. Moreover, it is necessary to prepare further legislation that makes possible a comprehensive implementation of the Directive's provisions. As a result of the measure, an energy datasheet will be prepared about buildings or apartments, which also gives a summary of the energy and energy efficiency characteristics of the building. The data sheet will make it possible for the owner of the building, or the buyer in the event of a change in ownership, to gain information quickly and efficiently about the energy efficiency characteristics of the building, which may favourably influence their decision. The energy demand arising in the course of operation of the building is highly significant. If builders and purchasers give preference to buildings that are more efficient from an energy consumption aspect as well, the effect will prove to be significant at a national level.
Annual energy savings target	14 -42 GWh/year; (0.05-0.15 PJ/year)
Nature and time scheduling of the measure:	2008 I. half: Acceptance of legislation 2008 II. half launching of the planned measure
Responsible party:	Ministry for Local Government and Regional Development Ministry of Economy and Transport

4.1.2.4 Periodic inspection of household boilers

Category:	(1.2) enactment of legislation (definition of minimum energy-related requirements)
Regional access:	whole country
Target group:	household boilers
End user target group	households operating boilers older than 5 years
Description	Implementation of the provisions set forth in Directive 2002/91/EC of 16 December 2002 by the European Parliament and the Council, as a first part of which TNM Decree 7/2006 on specification of the energy-related characteristics of buildings was created. Moreover, it is necessary to prepare further legislation making possible a comprehensive implementation of the Directive's provisions. By periodic inspection of household boilers, those boilers not complying with minimum energy efficiency requirements may be screened out. From a related monetary fund, credits under favourable conditions should be extended for replacement of boilers not complying with the minimum requirements
Annual energy savings target	14 -28 GWh/year; (0.05-0.1 PJ/year)
Nature and time scheduling of the measure:	2008. II. half: Acceptance of legislation 2009 I. half: launching of the planned measure
Responsible party:	Hungarian Commercial Licensing Office Ministry of Economy and Transport

4.1.2.5 Energy efficiency labelling of household boilers and climate control equipment

Category:	(2.2) Information (emphasis on energy-related characteristics)
Regional access:	whole country
Target group:	household boilers
End user target group	operators of household boilers
Description	Emphasis on the efficiency characteristics of newly procured boilers in a publicly understandable manner. Widespread use warrants a publicly understandable presentation of energy-related characteristics largely influencing the purchasing preferences of residential customers. Therefore, legislation facilitating the implementation of the measure is necessary.
Annual	8 -14 GWh/year; (0.03-0.05 PJ/year)

energy savings target	
Nature and time scheduling of the measure:	2009. I. half: Preparation of legislation, 2009 II. half: launching of the planned measure
Responsible party:	Hungarian Commercial Licensing Office Ministry of Economy and Transport

4.1.2.6 Energy efficiency labelling of household electric and gas boilers

Category:	(2.2) Information (emphasis on energy-related characteristics)
Regional access:	Whole country
Target group:	household electric and gas boilers
End user target group	household electric and gas boiler operators
Description	60% of Hungarian households use electric or gas boilers for heating water. The problem of labelling this equipment has remained unsolved so far. Labelling is warranted by widespread use. Therefore, legislation facilitating the implementation of the measure is necessary.
Annual energy savings target	8 -14 GWh/year; (0.03-0.05 PJ/year)
Nature and time scheduling of the measure:	2009. I. half: Preparation of legislation, 2009 II. half: launching of the planned measure
Responsible party:	Hungarian Commercial Licensing Office Ministry of Economy and Transport

4.1.2.7 Provision of assistance for purchasing household cooling machines of special energy efficiency with an "A" label and household refrigerating machines of special energy efficiency with an "A" label and other household machines, by replacement of old appliances

Category:	(3.1 and 3.3) financial measure (non-refundable assistance and/or credit with a favourable interest)
Regional access:	Whole country
Target group:	obsolete refrigerators and freezers and other household appliances

End user target group	households using obsolete refrigerators and freezers and other household machines
Description	More than 90% of Hungarian households use refrigerators and more than 60% use freezers. A significant part of refrigerators and freezers are obsolete, and they use a large amount of energy. A significant reduction of consumption of household electricity can be achieved if the replacement of obsolete refrigerators, freezers and other household appliances is encouraged by proper assistance.
Annual energy savings target	14-22 GWh/year (0.05-0.08) This can be achieved due to the efficiency of the electricity system by an end user saving realised in electricity of 4-7 GWh/year.
Nature and time scheduling of the measure:	2008. III. quarter Preparation and launch of assistance construction (NEP_2008)
Responsible party:	Ministry of Economy and Transport Hungarian Development Bank Zrt. Finance Ministry

4.1.2.8 Improvement of the propagation of energy-efficient lighting equipment (compact light tubes)

Category:	(2.1) Information (awareness building campaign)
Regional access:	whole country
Target group:	lighting equipment operating with traditional light bulbs
End user target group	households, institutes using traditional light bulbs for lighting purposes
Description	In Hungarian households, traditional light bulbs are used to an extent exceeding 99% for lighting purposes. The lifetime of compact light tubes is 8-10 times that of traditional light bulbs. Their energy consumption amounts to one-third or one-quarter of that of traditional light bulbs. However, their price is 5-6 times greater on the average. Presenting achievable savings, the campaign promotes the propagation of lighting equipment that makes it possible to reduce electric consumption for lighting purposes.
Annual energy savings target	19 -39 GWh/year; (0.07-0.14 PJ/year) This can be achieved due to the efficiency of the electricity system by an end user saving realised in electricity of 6-12 GWh/year.
Nature and time scheduling of the measure:	Continuous

Responsible party:	Ministry of Economy and Transport
4.1.2.9	**Working out energy efficiency-related training materials for application in primary and secondary education**
Category:	(2.5) Information (energy efficiency training)
Regional access:	whole country
Target group:	Educational curriculum
End user target group	students in primary and secondary education
Description	Education is the most efficient instrument in developing awareness. The appearance of energy efficiency in education may reflect the societal recognition for the role of energy efficiency. Various initiatives have taken place so far in Hungary to present the cause of energy efficiency in education. The majority of these resulted only in extracurricular, facultative educational activities, without actual integration of the issue in education. Energy efficiency should be taught in several school subjects, e.g. in physics, environmental protection and environmental studies. Upon including energy efficiency in education, experiences so far must be taken into account and a comprehensive programme must be elaborated in order to maximise the effects.
Annual energy savings target	3 -14 GWh/year; (0.01-0.05 PJ/year)
	Elaboration of curriculum 2008: elaboration of the curriculum September 2009: start of teaching of the curriculum
Responsible party:	Ministry for Education and Culture Ministry of Economy and Transport Ministry of Environment and Water

4.2. Measures in the tertiary sector

Summary table of measures planned in the tertiary sector:

No.	Measure	Action by end users triggered by the measure	Duration	Planned savings by 2016 [GWh/year]
4.2.1.1	Local municipality training, awareness building, consulting on the basis of experiences of the UNDP/GEF municipal energy efficiency program	sensible investments related to energy rationalisation	2008 - 2016	250
4.2.2.1	Third party financing - KEOP 5.2 construction	more dynamic energy efficiency activity	2008 - 2016	1.750
4.2.2.2	Encouragement of reduction of energy use in the Regional Operative Programs	taking into account energy savings in the course of town rehabilitation	2008 - 2016	125-175
4.2.2.3	Promotion of ESCO-type investment projects	more dynamic energy efficiency activity	2008 - 2016	125-625
4.2.2.4	Elaboration and implementation of energy efficiency Directives related to public procurements	application of equipment with better energy efficiency	2008 - 2016	1,250
4.2.2.5	Elaboration of minimum energy efficiency requirements for office equipment	reduction of energy use by institutions	2008 - 2016	250
	Total			**3,750 -4,300**

Results in energy savings can be furthermore increased by those regional development measures (which cannot be expressed numerically as of yet) which affect both the tertiary sector and the population and have an effect on the mitigation of energy use.

4.2.1. Further implementation of existing measures at state and municipal institutions

4.2.1.1 **Local municipality training, awareness building, consulting on the basis of experiences of the UNDP/GEF municipal energy efficiency program**

Category: (2.5)
Information, awareness building (information centres, education)

Regional access: whole country

Target group: institutions under municipal ownership

End user target group	public buildings, institutions under municipal ownership
Description	Hungarian municipalities and their institutions are significant consumers of energy. On the basis of experiences from training sessions and information campaigns performed in the course of the UNDP project, awareness building among municipal specialists should be continued even after project completion on 30 June 2008. During continuation, special emphasis must be placed on the transfer of best practice, the exchange of experiences, available financing opportunities, practical issues of energy efficiency audits and feasibility studies.
Annual energy savings target	28 GWh/year; (0.1 PJ/year)
Nature and time scheduling of the measure:	2008. I. half: creation of awareness building system, 2008 II. half: launching of the planned measure
Responsible party:	Ministry of Economy and Transport National Development Agency

4.2.2. Planned energy efficiency measures in the tertiary sector*

4.2.2.1 "Third party financing" - KEOP 5.2 construction

Category:	(3.1) for (5.2) financial measure (non-refundable assistance) for energy-related services (third party financing)
Regional access:	whole country
Target group:	State and municipal institutions
End user target group	state and municipal institutions needing energy efficiency renovation
Description	The construction summarizing investment projects implemented by ESCO companies at municipal and state institution is based on the fact that the enterprise performing the investment project will obtain the coverage required for the energy efficiency investment from the implemented energy savings. For promotion of the measure, the "third party financing" construction of the Environment and Energy Operative Programme in the New Hungary Development Plan provides a 15 billion HUF assistance for the 9-year period to facilitate the investment projects.

* Some of the measures may be applied in the army.

The following technical solutions can be implemented within the framework of the Program:

- external heat insulation of facades
- renovation of doors and windows
- replacement of doors and windows
- programmable heating regulation
- separation of heating systems of spaces of different function
- installation of thermostatic radiator valves
- regulation of boilers
- replacement of boilers
- modernisation of lighting
- modernisation of heating
- modernisation of heating and lighting

Annual energy savings target	195 GWh/year; (0.7 PJ/year)
Nature and time scheduling of the measure:	Launched in 2007 as a KEOP framework
Responsible party:	Ministry of Economy and Transport National Development Agency Energy Centre Kht.

4.2.2.2 Encouragement of reduction of energy use in the Regional Operative Programs

Category:	(3.1) financial measures (non-refundable assistance)
Regional access:	whole country
Target group:	Institutions, residential buildings
End user target group	Institutions, population
Description	Between 2007 and 2013 and within the framework of the NHDP, energy efficiency investment projects are supported by the ROP regional development and town rehabilitation priorities. The allowance available for various interventions in the ROPs is 9.4 billion HUF. The ROP assistance target groups are primarily represented by local municipalities, institutions, churches and civic organisation s, moreover, in the case of social-type town rehabilitation, residential energy-saving investment projects that can be financed in the joint ownership sections of panel buildings. The assistance intensity of applications will be 90% at most in the case of public institutions and 70% for residential buildings, thus, an investment project in the amount of 12-15 billion HUF can be implemented through the assistance amount of 9.4 billion HUF. Activities eligible for support: • reduction of energy use in institutions and public buildings

- modernisation of indoor and outdoor lighting systems
- improvement of the heat properties and reduction of heat loss in buildings by subsequent heat insulation and replacement of external doors and windows
- modernisation of the secondary energy supply systems
- reduction of energy use of public lighting

In the course of creating the assistance system, aspects of regional developments must be taken into account (e.g. in relation to rehabilitation of areas to be built in).

Annual energy savings target	14 -19 GWh/year; (0.05-0.07 PJ/year)
Nature and time scheduling of the measure:	Planned measure, to be launched in 2008
Responsible party:	Ministry for Local Government and Regional Development National Development Agency

4.2.2.3 Promotion of ESCO-type investment projects

Category:	(5.2) energy-related services (third party financing)
Regional access:	Whole country
Target group:	ESCO companies
End user target group	Users of services provided by ESCO companies
Description	By their complex services, ESCOs cover an energy efficiency market area that would otherwise remain unexploited due to a lack of preparation, decision-making capability or resources on behalf of consumers. By creation and further development of a regulatory environment, the sate will create the conditions for operation of ESCO companies achieving real improvement of energy efficiency. With regard to the latter, • it will define ESCO enterprises and distinguish them from other companies (determination of area of activities, legal status, etc.) • it will create financing opportunities supporting their operation
Annual energy savings target	14 -70 GWh/year; (0.05-0.25 PJ/year)
Nature and time scheduling of the measure:	2008. I. half: creation of legal regulations, 2008 II. half: creation of financing opportunities supporting operation

Responsible party:	Ministry of Economy and Transport Ministry for Justice and Law Enforcement Hungarian Development Bank

4.2.2.4 Elaboration and implementation of energy efficiency Directives related to public procurements

Category:	(4.3) and (2.7) voluntary undertaking (in the area of public procurements) Information (exemplary role of the public sector)
Regional access:	whole country
Target group:	investment projects implemented within the framework of public procurements
End user target group	parties involved in investment projects implemented within the framework of public procurements
Description	Act CXXIX of 2003 on public procurement refers to the lowest price and the most favourable overall offer among considerations of evaluations. Quality indicators, operating costs and cost efficiency may be evaluated among partial considerations. In this evaluation system, considerations of energy efficiency receive a lesser preference because installations with better energy efficiency indicators are generally more expensive. It is necessary for energy efficiency considerations to receive priority at public procurement tenders because selection of the cheapest offers is usually unfavourable from an energy efficiency aspect and cause a cost increase from the aspect of operation. For this purpose, guidelines should be elaborated which facilitate that offers received in public procurement procedures include an objectively measurable set of energy efficiency aspects and a related economic assessment.
Annual energy savings target	139 GWh/year; (0.5 PJ/year)
Nature and time scheduling of the measure:	2008: creation of legal regulations, 2009: implementation of the legislation
Responsible party:	Ministry for Justice and Law Enforcement Ministry of Economy and Transport

4.2.2.5 Elaboration of minimum energy efficiency requirements for office equipment

Category:	(1.2) enactment of legislation (minimum energy efficiency requirements)
Regional access:	whole country
Target group:	investors from state resources
End user target group	investors from state resources
Description	The weight of the tertiary sector is increasingly growing in the economy, and computers, photocopiers, fax machines and air conditioners are used in large numbers in offices. Energy efficiency categories and minimum requirements must be created for the most frequently used office equipment (equipment categories). After definition of minimum requirements, no investment project under the given level of requirements may be financed from state resources.
Annual energy savings target	28 GWh/year; (0.1 PJ/year) This can be achieved due to the efficiency of the electricity system by an end user saving realised in electricity of 9 GWh/year.
Nature and time scheduling of the measure:	2008. I. half: establishment and definition of energy efficiency categories and requirements concerning office equipment 2008 II. half: enactment of legislation
Responsible party:	Ministry for Justice and Law Enforcement Ministry of Economy and Transport

4.3. Measures in the industrial sector

Summary table of measures planned in the industrial sector:

No.	Measure	Action by end users triggered by the measure	Duration	Planned savings by 2016 [GWh/year]
4.3.1.1	Continuation of Energy Efficiency Credit Fund by inclusion of PHARE credit construction	application of favourable credits in the case of energy saving investments	2008 - 2016	1,375-1,625
4.3.1.2	KIOP 2006-1.7. environmentally friendly energy management	reduction of energy use	2008 - 2016	375
4.3.2.1	Renovation of distance heat supply systems, increasing the competitiveness of distance heat supply	reduction of energy use of distance heat systems	2008 - 2016	250-750
4.3.2.2	Environment and Energy Operative Programme “Efficient energy use”	reduction of energy use	2008 - 2016	1,875-2,250

	construction			
4.3.2.3	Mandatory application of energy management at large energy consumers	more professional energy management	2008 - 2016	500-1,000
4.3.2.4	Mandatory energy consumption report of large consumers	increase of the economic significance of energy use	2008 - 2016	250-500
4.3.2.5	Voluntary agreement (performance of audit, energy saving)	promotion of energy-saving investments, prudent conduct	2008 - 2016	250-375
4.3.3.1	Reduction of transformation losses in the electricity grid	reduction of the amount of energy needed for electricity generation	2008 - 2016	575-725
4.3.3.2	Utilisation of heat loss of transformers	replacement of other energy sources	2008 - 2016	125-175
	Total			**5,575 - 7,775**

4.3.1. Existing energy efficiency measures affecting the industrial sector, agriculture as well as state and municipal institutions

4.3.1.1 Continuation of Energy Efficiency Credit Fund by inclusion of PHARE credit construction

Category:	(3.3) financial measure (assisted loan)
Regional access:	whole country
Target group:	enterprises, institutions
End user target group	enterprises, institutions implementing energy efficiency investments
Description	Objective: substitution of traditional energy sources by renewable energy resources or waste energy, establishment of the condition of frugal management of energy sources, reduction or elimination of explored energy losses by a minimum amount of expenditures. The remaining resources of the PHARE credit construction completed in the I. quarter of 2008 must be integrated with the Energy Efficiency Credit Fund, thus, the available financial resources will exceed 4.5 billion HUF.
Annual energy savings target	153 -181 GWh/year; (0.55-0.65 PJ/year)
Nature and time scheduling of the measure:	2008 I. quarter: decision on the integration of PHARE and EHA resources From the II. quarter of 2008, review of the construction and conditions of the credit fund and its continuous operation
Responsible party:	Ministry of Economy and Transport

4.3.1.2	**KIOP 2006-1.7. environmentally friendly energy management**
Category:	(3.1) Financial measure (non-refundable assistance)
Regional access:	whole country
Target group:	Large investors of industrial and institutional sector, municipalities
End user target group	units in the industrial or institutional section aiming at the increase of energy efficiency or a larger share of utilisation of renewable energy sources
Description	increasing application of renewable energy sources, increase of energy efficiency, reduction of CO_2 emission, promotion of development of regions Beneficiaries of subsidy: • central budgetary bodies and their institutions, • local municipal bodies and their institutions • public interest companies, • business organisation s under majority municipal ownership, • foundations, associations, • churches, public bodies, • associations and the non-profit consortiums they form, • small and medium enterprises. The maximum amount of subsidy is 300 million HUF. (The investment cost has no upper limit). The subsidy intensity varies between 16-60% according to the objectives and applicants. Investments must be implemented within 2 years after signing the assistance contract.
Annual energy savings target	42 GWh/year; (0.15 PJ/year)
Nature and time scheduling of the measure:	According to the call for applications, said applications could be submitted from 1 May 2004 to the end of 2006. Investments aimed at the increase of renewable energy sources and the increase of energy efficiency will be characteristically implemented in the years 2007-2008. Results in energy savings will be manifested in the NHDP period. The objective is implementation of investment projects targeted by assisted applications as well as their maintenance, enforcement of compliance with the provisions of the subsidy application system by project owners
Responsible party:	National Development Agency Energy Centre Kht.

4.3.2. Planned measures affecting the industrial sector, agriculture as well as state and municipal institutions

4.3.2.1	**Renovation of distance heat supply systems, increasing the competitiveness of distance heat supply**
Category:	(3.1 and 3.3) financial measure (non-refundable assistance and/or credit with a favourable interest)
Regional access:	whole country
Target group:	distance heat suppliers
End user target group	distance heat supply
Description	Targeted state subsidies and/or credits with favourable interest rates must be applied to facilitate modernisation of distance heat supply, reduction of supply costs, separation and individual measurability of consumption locations. Areas to be subsidised: • increase of co-generated heat and electricity • energy modernisation , reduction of losses and heat centre modernisation on the supplier (primary) side • implementation of regulation and cost sharing on the consumer (secondary) side
Annual energy savings target	28 -83 GWh/year; (0.1-0.3 PJ/year)
Nature and time scheduling of the measure:	2008. I. half: establishment of the framework system of the assistance scheme, elaboration of legal and professional conditions. 2008 II. half: launching of the assistance construction
Responsible party:	Ministry for Local Government and Regional Development National Development Agency Hungarian Development Bank Ministry of Economy and Transport

4.3.2.2	**Environment and Energy Operative Programme "Efficient energy use" construction**
Category:	(3.1) financial measure (non-refundable assistance)
Regional access:	Whole country
Target group:	industrial and institutional sector, municipalities • small and medium enterprises • central budgetary bodies and their institutions

- multipurpose micro-regional associations of local municipalities, local minority self-government bodies, community municipalities as well as budgetary bodies and their institutions under their supervisions
- bodies subject to Act 1997/156 on public purpose organisation s
- business organisation s under majority municipal ownership
- persons under church law and their institutions
- civic organisation s

End user target group	industrial and institutional sector
Description	The KEOP "Efficient energy use" construction supports the further investment projects of institutions as well as small and medium enterprises: 1. Reduction of energy use in buildings maintained by the target group. 2. Reduction of energy utilisation of public lighting. 3. Primary side energy efficiency modernisation of distance heat supply. 4. Energy-related modernisation of industrial and office buildings of small and medium enterprises. 5. Investment projects implemented along with an increase of energy efficiency and facilitating the utilisation of renewable energy sources as well as complex interventions (encompassing several activities). 6. Energy efficiency investments implemented by third party financing for the above activities. Non-refundable subsidies will be awarded to recipients within the framework of a tender application system. Calls for tenders were issued on 18 September 2007. Implementation of the investments may mostly take place from the year 2008.
Annual energy savings target	208 -250 GWh/year; (0.75-0.9 PJ/year)
Nature and time scheduling of the measure:	Following the issuance of a call for applications, from 24 October 2007, receipt, processing of applications, implementation of projects. 2008. I. half: elaboration of an action plan for the period between 2009-2013
Responsible party:	National Development Agency Ministry of Economy and Transport Energy Centre Kht.

4.3.2.3 Mandatory application of energy management at large energy consumers

Category:	(2.5) Information, awareness building (continuing education)

Regional access:	Whole country
Target group:	large consumers in the industrial and institutional sector
End user target group	large consumers in the industrial and institutional sector
Description	In the field of energy management, it is of great significance that persons responsible for energy management hold suitable qualifications. At large energy consumers, improvement of the standard of energy management usually results in a significant saving of energy. The system of energy management experts was formerly in operation in Hungary, which was favourable from a professional aspect. Energy management experts applied at large industrial companies and public institutions represented an energy management culture which benefited both the energy consuming institution and the whole country. The regulation concerning mandatory employment of energy management experts was revoked under the general economic liberalisation . In the absence of mandatory regulations, most energy consuming organisation s abolished the status of energy management experts, in order to achieve savings in wages. Except for some industrial companies and institutions, no energy management experts are employed today, and persons holding a great variety of qualifications are engaged in the issues of energy management. The standard of energy management can be greatly improved at large energy consumers by a mandatory reinstatement of the system of energy management experts.
Expected energy savings	56 -111 GWh/year; (0.2-0.4 PJ/year)
Nature and time scheduling of the measure:	2008: enactment of legislation concerning mandatory employment of energy management experts at large consumers 2009: launching of the system
Responsible party:	Ministry for Social and Labour Affairs Ministry of Economy and Transport

4.3.2.4 Mandatory energy consumption report of large consumers

Category:	(2.8) Information (measurement and raising of awareness)
Regional access:	Whole country
Target group:	large consumers in the industrial and institutional sector
End user target group	large consumers in the industrial and institutional sector
Description	Large consumers are responsible for a significant share of the energy consumption in the country. It is an important national interest that proper energy management take place at large consumers and efforts be made for improvement of energy

	efficiency. Although economic interest of large consumers persists in a theoretical sense, international experience shows that administrative obligation is also warranted apart from economic interest. In order to achieve this, large consumers exceeding a given amount of annual energy consumption should be obligated in relevant legislation to a) deliver a properly detailed report on their data related to energy use or the improvement of energy efficiency, b) prepare a work plan regarding improvement of energy efficiency and a detailed report on the implementation of the latter
Expected energy savings	28 -56 GWh/year; (0.1-0.2 PJ/year)
Nature and time scheduling of the measure:	2008. I. half: enactment of legislation 2008. II. half: launching of the planned system
Responsible party:	Ministry for Justice and Law Enforcement Ministry of Economy and Transport Industrial Energy Consumer Forum

4.3.2.5 Voluntary agreement (performance of audit, energy saving)

Category:	(4.2) and (2.4) voluntary agreements (industrial organisation s of energy-intensive sectors) Information (performance of energy-related audits)
Regional access:	whole country
Target group:	energy-intensive sectors
End user target group	energy-intensive sectors
Description	The state will conclude agreements with major groups involved in energy, e.g. • energy-intensive industries, • energy-industry, • manufacturers of individual end-user appliances. Within the framework of the agreement, the above-named groups will undertake efficient energy utilisation , e.g. • reduction of energy use • application of more efficient energy supply technologies, • development of products with better energy efficiency indicators. In order to provide a remuneration of these undertakings, the state will provide favourable publicity to the groups signing the agreement, give exemption from applying “mandatory” rules and

	provide financial support for implementation of measures set forth in the agreements. For implementation of voluntary measures, negotiating partners with proper mandates and credibility are needed on both sides.
Annual energy savings target	28 -42 GWh/year; (0.1-0.15 PJ/year)
Nature and time scheduling of the measure:	system of voluntary undertakings, to be launched in 2008
Responsible party:	Ministry of Economy and Transport

4.3.3. Energy savings achievable in an electricity transmission grid

Energy savings achievable in this manner are handled as security reserves for the case when the measures included in the proposal are not fully implemented.

Interventions to be implemented:

4.3.3.1	**Reduction of transformation losses in the electricity grid**
Category:	(4.2) and (3.1) voluntary subsidies, financial measures by non-refundable assistance (system management)
Regional access:	Whole country
Target group:	Electricity grid system management
End user target group	energy consumers
Description	Replacement of transformers to those involving a low level of loss in high and medium voltage grids in order to reduce transformation losses.
Annual energy savings target	20-25 GWh/year at an end user level, which represents savings of (0.23-0.29 PJ/year) i.e. 64-81 GWh due to the efficiency of the electricity system
Nature and time scheduling of the measure:	system of voluntary undertakings, to be launched in 2008
Responsible party:	Ministry of Economy and Transport

4.3.3.2	**Utilisation of heat loss of transformers**
Category:	(4.2) and (3.1) voluntary agreements, financial measures by non-refundable

	assistance (industrial organisation s of energy-intensive sectors)
Regional access:	Whole country
Target group:	Electricity grid system management
End user target group	Heat energy users
Description	Utilisation of heat loss of transformers for heating of buildings The waste heat generation during transformation processes is currently not utilised. The utilisation of waste heat as heat energy can be configured.
Annual energy savings target	14 -19 GWh/year; (0.05-0.07 PJ/year)
Nature and time scheduling of the measure:	system of voluntary undertakings, to be launched in 2008
Responsible party:	Ministry of Economy and Transport

4.4. Planned energy efficiency measures in the transportation sector

Summary table of measures planned in the transportation sector:

No.	Measure	Action by end users triggered by the measure	Duration	Planned savings by 2016 [GWh/year]
4.4.1.1	Maintenance and extension of road charge payable by heavy road vehicles	more rational transportation organisation	2008 - 2016	875-1,250
4.4.1.2	P+R system for energy-efficient passenger transportation	more frugal transportation ethics	2008 - 2016	25-250
	Total			**90 - 1,500**

4.4.1. Measures in the transportation sector

4.4.1.1	**Maintenance and extension of road charge payable by heavy road vehicles**
Category:	(3.2) financial measure (consumption charge, tax)
Regional access:	Whole country
Target group:	Heavy motor vehicles

End user target group	public road transportation
Description	In 2007, Hungary introduced road tolls for trucks with allowed total weights exceeding 12 tons on a significant portion of the national public road network and is planning to extend these tolls to other, minor roads, as well. The planned amount of the road toll is 40 HUF/km, which is comparable with the fuel expense of motor vehicles transporting goods, which is ca. 75-80 HUF/km. As a result of the road toll, the empty run of trucks will be reduced, utilisation of cargo weight capacity will be improved and some freight tasks will be shifted towards environmentally friendly and more efficient means of transportation, which will result in a ca. 0.5-1% reduction of the total run. Taking into account the number of heavy motor vehicles subject to road toll (ca. 70 thousand vehicles), yearly run (inland: 70 thousand km/year, international: 117 thousand km/year, average 80 thousand km/year) and an average consumption of 30 litres / 100 km, the reduction of energy use related to the introduction of the road toll by the end of the period of 2007-2015 is 700-1,400 GWh/year.
Annual energy savings target	97 -139 GWh/year; (0.35-0.5 PJ/year)
Nature and time scheduling of the measure:	maintenance of existing measures, extension in 2008
Responsible party:	Ministry of Economy and Transport

4.4.1.2 P+R system for energy-efficient passenger transportation

Category:	(5) Energy efficiency service (P+R system)
Regional access:	whole country
Target group:	passenger automobile, community transportation
End user target group	passenger automobile drivers
Description	Construction of safe indoor parking facilities at the inner city boundary points of the public transportation network. These indoor parking facilities can be used free of charge or at a significant discount if the driver utilises them in a P+R system. In order to monitor this, an integrated electronic ticket and pass system should be introduced, which can be used to check whether the driver used any public transportation after parking. A successfully operating P+R system can greatly improve the demand for community transportation, which results in the reduction of energy use by transportation
Expected energy savings:	3 -28 GWh/year; (0.01-0.1 PJ/year)

Nature and time scheduling of the measure:	Planned measure, may be launched in 2009
Responsible party:	**Ministry for Local Government and Regional Development** city municipalities

4.4.2. Potential measures in transportation involving significant effects which cannot yet be expressed in numerical terms

- In the event of application of alternative and renewable fuels, requirement regarding maintenance of energy efficiency at a respective level.
- Consumer information to facilitate more energy efficient transportation.
- Specification of an optimum speed from the aspect of transportation and energy efficiency, creation of the system of following a proper norm (measurement of average speed), establishment of further low traffic zones within residential areas.
- In the event of public procurements - or commissioning private contractors for the performance of public services or tasks - increased emphasis on the fuel efficiency of vehicles involved in procurement and services as an aspect of evaluation.
- Specification of measures (development of traffic infrastructure, introduction of on-line traffic information systems with predictive on-line systems or operation of separate traffic radio) required for improvement of the efficiency of transportation (i.e. the quotient of necessary minimum transportation time and the actual time spent for transportation)
- Creation of adaptive traffic lights and traffic systems.
- Optimisation of urban merchandise transport and freight transportation outside peak time reduces general urban congestion and the reduction of the level of impediments improves energy efficiency of traffic and goods transportation. The use of the existing tramway network for freight transportation purposes signifies a smaller amount of specific energy use in urban and/or suburban goods transportation.
- Increased prevalence of combined merchandise transport (using water routes, as well)

4.5. Horizontal and cross-sector measures

Summary table of planned horizontal measures:

No.	Measure	Action by end users triggered by the measure	Duration	Planned savings by 2016 [GWh/year]
4.5.1.1.	Awareness building - instruction of special consumer groups	conscious energy saving behaviour	2008 - 2016	6
	Total			**6**

4.5.1. Horizontal measures

4.5.1.1	**Awareness building - instruction of special consumer groups**
Category:	(2.5) Information, awareness building (education)
Regional access:	whole country
Target group:	Special energy consumer groups
End user target group:	Special energy consumer groups
Description	Society can be shaped by instruction of energy awareness. Integration of the topic of energy efficiency in education should cover not only primary and secondary school students but requirements regarding basic knowledge must be formulated for groups delivering examples, exerting influences and giving knowledge via their work. Therefore it is useful that the training programme will cover - students of tertiary educational institutions not specialised in energy - teachers - municipal specialists, as well. Collection and evaluation of already existing domestic and international educational materials can provide help for the creation of a basic educational level. Domestic introduction of awareness shaping programs by the European Union recommended for exerting a direct influence on society's energy awareness can be implemented via EU aid allocations.
Annual energy savings target	6 GWh/year; (0.02 PJ/year)
Nature and time scheduling of the measure:	The planned measure may be introduced in 2008.
Responsible party:	Ministry for Education and Culture Ministry of Economy and Transport Ministry of Environment and Water

5. Implementation and monitoring, institutional framework of implementation

By 2016, energy source savings in the amount of 15,955 GWh/year (57.4 PJ/year) can be achieved through the measures of the National Energy Efficiency Action Plan. Energy efficiency measures achievable by proper implementation of measures by the end of the period 2008-2016 exceed the level of 1%/year. For the purpose of monitoring plan-related figures, determination of a more realistic energy conservation potential as well as a more accurate determination of expected subsidy needs determined by approximating calculations in Annex II - and creating a basis for the necessary state resources - a competent professional organisation will be assigned in 2008 to prepare a relevant audit.

5.1. Framework conditions of implementation:

5.1.1. Governmental representative of implementation and main coordinator

The condition for realizing energy savings planned by the Action Plan is that apart from the realisation of KEOP and ROPs within the framework of the NHDP, other measures within the responsibilities of related ministries will be implemented, as well. Moreover, later on, subsidy allowances to be established quantitatively in the course of an audit to be performed in relation to the energy saving potential must be available. Proper financing conditions must be provided by creation and application of economic incentives - aids, tax measures and legal provisions.
In accordance with the renewable energy source strategy prepared by the GKM, budgetary sources required for the assistance may be provided by regrouping missing price subsidies of fossil energy sources as well as incomes arising from the energy tax and air pollution fee. Moreover, other potential sources - such as the KvVM's "green investment program" - should also be investigated, which provide further instruments for supporting the measures of the Action Plan and the use of revenues from emission trading for the purpose of increasing energy efficiency.

Pursuant to Article 4 (4) of Directive 2006/32/EC on energy end-use efficiency and energy services, Member States must designate that (those) existing or new authority (authorities) or agency (agencies) which are responsible for overseeing compliance with the energy saving objective set forth in the Action Plan and reporting regarding the results. Pursuant to Article 5 of the Directive, the public sector is required to act in an exemplary manner in relation to the Directive, and the body (bodies) responsible for administrative, management and implementation tasks of these measures are to be indicated in the Action Plan.

The Directorate-General for Energy at the Ministry of Economy and Transport will be in charge of elaboration and monitoring of implementation of the National Energy

Efficiency Action Plan. The activity of the Directorate-General will ensure that the National Energy Efficiency Action plan be fully harmonised with Hungary's energy policy and represented in the latter with the proper emphasis.

For the tasks specified in Articles 4 and 5 of the Directive, the most suitable body is the Hungarian energy agency, Energy Centre Kht, thus, the Directorate-General for Energy of the Ministry of Economy and Transport (GKM) intends to assign the implementation of tasks related to carrying out the National Energy Efficiency Action Plan to Energy Centre Kht.

5.1.2. Presentation of responsibilities and tasks of the parties involved in implementation

The major governmental and professional parties involved in implementation are as follows:

Abbreviation	Name	Area of responsibility
GKM	Ministry of Economy and Transport	Issues related to energy and economy
IRM	Ministry for Justice and Law Enforcement	Issues related to legislation and its amendment
KvVM	Ministry of Environment and Water	Emission trading and environmental issues and implementation of KEOP
OKM	Ministry for Education and Culture	Issues related to education and awareness building
ÖTM	Ministry for Local Government and Regional Development	Issues related to local governments, regional development and the panel program
GKM-PM	Ministry of Finance	Issues related to financial regulation and allocation of support
SzMM	Ministry for Social and Labour Affairs	Issues related to labour (e.g. mandatory employment)
EK Kht.	Energy Centre Kht.	Coordination of implementation of the action plan and monitoring progress of implementation
MFB	Hungarian Development Bank Zrt.	Issues related to favourable development credit schemes
MKEH	Hungarian Commercial Licensing Office	Issues related to commerce
NFÜ	National Development Agency	Issues related to the elaboration and review of the New Hungary Development Plan (NHDP)

5.1.3. System of monitoring implementation

The present Action Plan defines the partial objective of 2010 (2,600 GWh) and the objective of 2016 (15,955 GWh).

In a manner specified in the Directive (ESD), the date of review of the first Action Plan, i.e. the date of submission of the second Action Plan, is 30 June 2011 and that of the third Action Plan is 30 June 2014.

Prior to submission of the next action plan, evaluation of the preceding action plan is a task of special importance. Subsequent action plans must evaluate experiences from the measures of previous plans and include a summary of related monitoring reports and following a strategic review, proper modifications must be made for the quickest and most effective achievement of specified goals.

Continuous monitoring of individual programs on behalf of Energy Centre Kht - a body in charge of monitoring performance of and coordination of various measures – is beneficial in order to facilitate the potentially necessary transformation or fine-tuning of individual measures.

Energy Centre Kht. will prepare annual monitoring reports about the results of the respective measures, which will be approved by GKM and submitted to the Government by the same Ministry for information purposes.

I. Appendix

Statistical/methodological appendix: statistical tables and forecasts supporting the national targets (statistical tables and calculations supporting the national target in PJ)

Table IF-1 depicts saving targets and results that can be achieved by individual measures in GWh.

Table IF-1

Total national energy saving target (annual cumulative) planned by 2016			**15,955 GWh (57.4 PJ)**
Total interim national energy saving target (annual cumulative) planned by 2010			**2,600 GWh (9.4 PJ)**
Energy efficiency programs and other measures		Annual energy savings by 2010 (GWh/year)	Annual energy savings by 2016 [GWh/year]
Measures in the residential sector			
4.1.1.1	Support for energy-efficient modernisation of residential buildings built by industrialised technologies	250	1125
4.1.1.2	"For a Successful Hungary" residential energy savings assistance and credit programme (NEP assistance application system)	167-222	750-1.000
4.1.2.1	Application of individual measurements, miniature heat centres in distance heat supply	83	375
4.1.2.2	Development of the operation of an energy efficiency consultant network	83	375
4.1.2.3	Energy-related certification of buildings	28-83	125-375
4.1.2.4	Periodic inspection of household boilers	28-56	125-250
4.1.2.5	Labelling of household boilers and climate control equipment	17-28	75-125
4.1.2.6	Energy efficiency labelling of household electric and gas boilers	17-28	75-125
4.1.2.7	Provision of assistance for purchasing household cooling machines of special energy efficiency with an "A" label and household refrigerating machines of special energy efficiency with an "A" label and other household machines, by replacement of old appliances	28-44	125-200
4.1.2.8	Improvement of the propagation of	39-78	175-350

	energy-efficient lighting equipment (compact light tubes)		
4.1.2.9	Working out energy efficiency-related training materials for application in primary and secondary education	6-28	25-125
Measures in the tertiary sector			
4.2.1.1	Municipality-level training, awareness shaping, consulting on the basis of experiences from the UNDP/GEF municipal energy efficiency program	56	250
4.2.2.1	Third party financing" - KEOP construction	489	1.750
4.2.2.2	Encouragement of reduction of energy use in Regional Operative Programs	28-39	125-175
4.2.2.3	Promotion of ESCO-type investments	28-139	125-625
4.2.2.4	Elaboration and application of energy efficiency Directives related to public procurements	278	1.250
4.2.2.5	Elaboration of minimum energy efficiency requirements concerning office equipment	56	250
Measures in the industrial sector			
4.3.1.1	Continuation of Energy Efficiency Credit Fund by integration of PHARE credit construction	306-361	1.375-1.625
4.3.1.2	KIOP 2006-1.7 environmentally friendly energy management	83	375
4.3.2.1	Renovation of distance heat supply system, increasing competitiveness of distance heat supply	56-167	250-750
4.3.2.2	Environment and Energy Operative Programme "Efficient Energy Use" construction	417-500	1.875-2.250
4.3.2.3	Mandatory employment of energy management experts at large energy consumers.	111-222	500-1.000
4.3.2.4	Mandatory energy consumption report of large consumers.	56-111	250-500
4.3.2.5	Voluntary agreement (performance of audit, energy conservation)	66-83	250-375
4.3.3.1	Reduction of transformation losses on the electricity grid.	128-161	575-725
4.3.3.2	Utilisation of heat loss of transformers	28-39	125-175
Measures in the transportation sector			
4.4.1.1	Maintenance and extension of road toll payable by heavy road vehicles	194-278	875-1.250
4.4.1.2	P+R system for energy efficient personal transportation	6-56	25-250

Horizontal and cross-sector measures 4.5.1.1 Awareness building - instruction of special consumer groups	11	50
Total planned energy conservation according to the ESD	**3.028- 4.011 GWh (10.9 - 14.4 PJ)**	**13,625- 18,050 GWh (49.05 -64.95 PJ)**

Table IF-2 depicts saving targets and results that can be achieved by individual measures in PJ.

Table IF-2

Total national energy saving target (annual cumulative) planned by 2016		**57.4 PJ (15,955 GWh)**
Total interim national energy saving target (annual cumulative) planned by 2010 (PJ)		**9.4 PJ (2,600 GWh)**
Energy efficiency programs and other measures	Annual energy savings by 2010 (PJ/year)	Annual energy savings by 2016 [PJ/year]
Measures in the residential sector		
4.1.1.1 Support for energy-efficient modernisation of residential buildings built by industrialised technologies	0,9	4,05
4.1.1.2 “For a Successful Hungary” residential energy savings assistance and credit programme (NEP assistance application system)	0,6-0,8	2,7-3,6
4.1.2.1 Application of individual measurements, miniature heat centres in distance heat supply	0,3	1,35
4.1.2.2 Development of the operation of an energy efficiency consultant network	0,3	1,35
4.1.2.3 Energy-related certification of buildings	0,1-0,3	0,45-1,35
4.1.2.4 Periodic inspection of household boilers	0,1-0,2	0,45-0,90
4.1.2.5 Labelling of household boilers and climate control equipment	0,06-0,10	0,27-0,45
4.1.2.6 Energy efficiency labelling of household electric and gas boilers	0,06-0,10	0,27-0,45
4.1.2.7 Provision of assistance for purchasing household cooling machines of special energy efficiency with an “A” label and household refrigerating machines of special energy efficiency with an “A” label and other household machines, by replacement of old	0,10-0,16	0,45-0,72

	appliances		
4.1.2.8	Improvement of the propagation of energy-efficient lighting equipment (compact light tubes)	0,14-0,28	0,63-1,26
4.1.2.9	Working out energy efficiency-related training materials for application in primary and secondary education	0,02-0,10	0,09-0,45
Measures in the tertiary sector			
4.2.1.1	Municipality-level training, awareness shaping, consulting on the basis of experiences from the UNDP/GEF municipal energy efficiency program	0,2	0,9
4.2.2.1	Third party financing" - KEOP 5.2 construction	1,4	6,3
4.2.2.2	Encouragement of reduction of energy use in Regional Operative Programs	0,10-0,14	0,45-0,63
4.2.2.3	Promotion of ESCO-type investments	0,10-0,50	0,45-2,25
4.2.2.4	Elaboration and application of energy efficiency Directives related to public procurements	1,0	4,5
4.2.2.5	Elaboration of minimum energy efficiency requirements concerning office equipment	0,2	0,9
Measures in the industrial sector			
4.3.1.1	Continuation of Energy Efficiency Credit Fund by integration of PHARE credit construction	1,10-1,30	4,95-5,85
4.3.1.2	KIOP 2006-1.7 environmentally friendly energy management	0,3	1,35
4.3.2.1	Renovation of distance heat supply system, increasing competitiveness of distance heat supply	0,2-0,6	0,9-2,70
4.3.2.2	Environment and Energy Operative Programme "Efficient Energy Use" construction	1,5-1,8	6,75-8,10
4.3.2.3	Mandatory employment of energy management experts at large energy consumers.	0,4-0,8	1,8-3,6
4.3.2.4	Mandatory energy consumption report of large consumers.	0,2-0,4	0,9-1,8
4.3.2.5	Voluntary agreement (performance of audit, energy conservation)	0,2-0,3	0,9-1,35
4.3.3.1	Reduction of transformation losses on the electricity grid.	0,46-0,58	2,07-2,61
4.3.3.2	Utilisation of heat loss of transformers	0,10-0,14	0,45-0,63
Measures in the transportation sector			
4.4.1.2	Maintenance and extension of road toll payable by heavy road vehicles	0,7-1,0	3,15-4,5
4.4.1.3	P+R system for energy efficient	0,02-0,2	0,09-0,9

personal transportation		
Horizontal and cross-sector measures 4.5.1.1 Awareness building - instruction of special consumer groups	0,04	0,18
Total planned energy conservation according to the ESD	**10,9- 14,4**	**49,05- 64,95**

Specification of the national target in GWh (Source: Energy Centre Kht.)

Table F1-3

	2001		Total	2002		Total
	Not electr.	Electr.		Not electr.	Electr.	
	GWh			GWh		
Final energy consumption total	167 303	29 601	196 904	166 536	30 483	197 019
Consumption subject to emission trading	23 950	4 345	28 295	23 836	4964	28800
Consumption amount affected by the Directive	143 353	25 256	**168 609**	142 700	25 519	**168 219**
Population	60 360	10 130	70 490	60 293	10 440	70 733
Communal sector	29 538	9 567	39 105	27 660	9 321	36 981
Industry without CO_2 trading	9 828	3 566	13 394	9 730	3 692	13 422
Transportation	36 695	1 031	37 726	38 443	1 015	39 458
Agriculture	6 932	962	7 894	6 573	1 051	7 624

	2003		Total	2004		Total
	Not electr.	Electr.		Not electr.	Electr.	
	GWh			GWh		
Final energy consumption total	172 299	31 363	203 662	169 823	31 805	201 628
Consumption subject to emission trading	22 413	4 883	27296	23 010	4 962	27 972
Consumption amount affected by the Directive	149 886	26 480	**176 366**	146 813	26 843	**173 656**
Population	67 689	11 063	78 752	60 979	11 032	72 011
Communal sector	28 048	9 426	37 474	28 270	9 657	37 927
Industry without CO_2 trading	9 202	3 889	13 091	9 363	3 989	13 352
Transportation	38 799	1 045	39 844	42 010	1 093	43 103
Agriculture	6 148	1 056	7 204	6 190	1 072	7 262

	2005		Total	2006		Total
	Not electr.	Electr.		Not electr.	Electr.	
	GWh			GWh		
Final energy consumption total	175 479	32 334	207 813	180 380	33 376	213 756
Consumption subject to emission trading	21 207	5 161	26 368	21 868	5 194	27 062
Consumption amount affected by the Directive	154 273	27 173	**181 446**	158 512	28 183	**186 695**

Population	62 147	11 115	73 262	64 272	11 453	75 725
Communal sector	30 009	10 052	40 061	29 508	10 296	39 804
Industry without CO_2 trading	8 414	3 985	12 399	8 439	4 339	12 778
Transportation	47 403	1 096	48 499	50 276	1 199	51 475
Agriculture	6 299	925	7 224	6 017	896	6 913

Specification of the national target in PJ

Table F1-4

	2001		Total	2002		Total
	Not electr.	Electr.		Not electr.	Electr.	
	PJ			PJ		
Final energy consumption total	602,29	106,56	708,85	599,53	109,74	709,27
Consumption subject to emission trading	86,22	15,64	101,86	85,81	17,87	103,68
Consumption amount affected by the Directive	516,07	90,92	**606,99**	513,72	91,87	**605,59**
Population	217,30	36,47	253,77	217,06	37,58	254,64
Communal sector	106,34	34,44	140,78	99,58	33,56	133,14
Industry without CO_2 trading	35,38	12,84	48,22	35,03	13,29	48,32
Transportation	132,10	3,71	135,81	138,40	3,65	142,05
Agriculture	24,96	3,46	28,42	23,66	3,78	27,44

	2003		Total	2004		Total
	Not electr.	Electr.		Not electr.	Electr.	
	PJ			PJ		
Final energy consumption total	620,28	112,91	733,19	611,36	114,50	725,86
Consumption subject to emission trading	80,69	17,58	98,27	82,84	17,86	100,70
Consumption amount affected by the Directive	539,59	95,33	**634,92**	528,53	96,64	**625,17**
Population	243,68	39,83	283,52	219,53	39,72	259,25
Communal sector	100,97	33,94	134,91	101,77	34,77	136,54
Industry without CO_2 trading	33,13	14,00	47,13	33,71	14,36	48,07
Transportation	139,68	3,76	143,44	151,24	3,94	155,18
Agriculture	22,13	3,80	25,93	22,28	3,86	26,14

	2005		Total	2006		Total
	Not electr.	Electr.		Not electr.	Electr.	
	PJ			PJ		
Final energy consumption total	631,73	116,40	748,13	649,37	120,15	769,52
Consumption subject to emission trading	76,34	18,58	94,92	78,72	18,70	97,42
Consumption amount affected by the Directive	555,38	97,82	**653,20**	570,64	101,46	**672,10**
Population	223,73	40,01	263,74	231,38	41,23	272,61
Communal sector	108,03	36,19	144,22	106,23	37,07	143,30

Industry without CO_2 trading	30,29	14,35	44,64	30,38	15,62	46,00
Transportation	170,65	3,95	174,60	180,99	4,32	185,31
Agriculture	22,68	3,33	26,01	21,66	3,23	24,89

The following table lists the summary of the above annual energy consumption values in PJ

	2002	2003	2004	2005	2006	
	Total	Total	Total	Total	Total	Five-year average
	PJ	PJ	PJ	PJ	PJ	PJ
Final energy consumption total	709,27	733,19	725,86	748,13	769,52	737,19
Consumption subject to emission trading	103,68	98,27	100,70	94,92	97,42	99,00
Consumption amount affected by the Directive	**605,59**	**634,92**	**625,17**	**653,20**	**672,10**	**638,19**
Population	254,64	283,52	259,25	263,74	272,61	266,75
Communal sector	133,14	134,91	136,54	144,22	143,30	138,42
Industry without CO_2 trading	48,32	47,13	48,07	44,64	46,00	46,83
Transportation	142,05	143,44	155,18	174,60	185,31	160,11
Agriculture	27,44	25,93	26,14	26,01	24,89	26,08

Source: Energy Centre Kht.

II. Appendix

Estimation of investment projects necessary for energy savings allocated for 2008-2016 and the demand for state assistance

The energy conservation required in the monitored 9 year period is 6.38 PJ per year, which will reduce the given annual domestic energy demand to an extent of 57.4 PJ/year by the end of 2016.
The resource-side energy demand value of 6.38 PJ per year can be logically taken into account by a composite price of two dominant energy sources in domestic energy use (natural gas represents 44% and liquid hydrocarbons represent 26% within the level of use). Average gross end user prices by the end of the year 2007.

- natural gas 2,850 HUF/GJ (2.85 billion HUF/PJ)
- liquid hydrocarbons 10,000 HUF/GJ (10 billion HUF/PJ)

The major part of energy conservation is expected in relation to heat demand, thus an energy interval between 4-5,000 HUF/GJ can be considered realistic. By the energy value interval calculated this way, the value of energy conservation of 6.38 PJ/year is

$$M = 25.5\text{-}31.9 \text{ billion HUF/year}$$

The average period of return of energy saving investments (j_m) can be estimated to be around 10 years, thus, the value of necessary annual investment by a simplified calculation is as follows:

$$i_m = Byear/M.$$
$$Byear = i_m \times M = 255\text{-}319 \text{ billion HUF.}$$

Thus, a total amount of 2295-2870 billion HUF of investment is needed in 9 years for the attainment of 1 % energy conversion per year.

The amount of necessary state subsidy will depend subsequently by the applicable subsidy intensity:

- at 10% average subsidy intensity, the necessary assistance: 25-32 billion HUF/year (for 9 years, the total amount is 230-290 billion HUF)
- at 20% average subsidy intensity, the necessary assistance: 51-64 billion HUF/year (for 9 years, the total amount is 460-570 billion HUF)
- at 30% average subsidy intensity, the necessary assistance: 75-95 billion HUF/year (for 9 years, the total amount is 690-860 billion HUF)

In the Environment and Energy Operative Programme of the NHDP, a subsidy allowance of 38.2 billion HUF is available for this period, which is also increased by other sources - Energy Saving Credit Fund, Central Hungary Operative Programme - by a maximum amount of 10-20 billion HUF. The KvVM's planned green investment system represents further unspecified growth of resources. It can be established that

further, significant sources of assistance will be necessary for the implementation of the specified goals, the source of which is not specified at present (implementation of the action plan is only realistic along with the present financial and budget expectations if the EU provides relevant resources).