

# HUNGARY

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## 1. SOURCES OF INFORMATION

Hungary's Fourth National Communication under the United Nations Framework Convention on Climate Change, 2006 and Hungary's Report on Demonstrable Progress, 2006.

Hungary's Third National Communication under the United Nations Framework Convention on Climate Change, 2001.

National Allocation Plan of Hungary 2008 to 2012 (NAP2), 17 January 2007, [http://ec.europa.eu/environment/climat/pdf/nap\\_hungary\\_final.pdf](http://ec.europa.eu/environment/climat/pdf/nap_hungary_final.pdf).

The European Community's initial report under the Kyoto Protocol - Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol (Submission to the UNFCCC Secretariat), EEA Technical report No 10/2006

Öko Institut, (accessed June 2007), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

### **Base-year emissions**

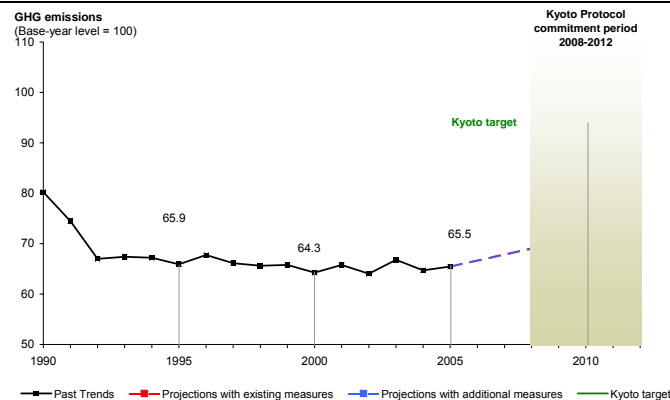
Base-year data is as reported by Member States in the sources noted above. Base year for Hungary is the average of the years between 1985 and 1987 for all GHG gases except for F-gases, which is 1995.

Base year data is not consistent with data reported in *The European Community's initial report under the Kyoto Protocol - Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol (Submission to the UNFCCC Secretariat)*, EEA Technical report No 10/2006. This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

## 2. SUMMARY

### HUNGARY

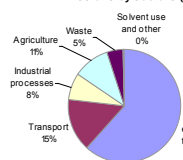
Emissions base year (initial report)	123.0 Mt
Emissions 2005	80.5 Mt
Emissions base year (for projections)	122.2 Mt
Projections 2010 with existing measures	87.4 Mt
Projections 2010 with additional measures	87.1 Mt
Kyoto target (absolute)	115.7 Mt
Kyoto target (% from base year)	- 6.0 %
Change base year to 2005	- 34.5 %
Change 2004-05	+ 1.2 %
Change base year to 2010 with existing measures	- 28.5 %
Change base year to 2010 with additional measures	- 28.7 %
Distance to linear target path 2005	- 30.0 index points
Use of Kyoto mechanisms	n.a.
Sinks (Articles 3.3 and 3.4)	n.a.
Emissions in 1990 (Article 3.7)	n.a.



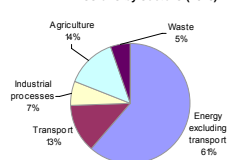
**Past emissions:** Hungary's GHG emissions were 1.2 % above those of 2004 and 34.5 % below base-year levels in 2005. The main factor for increasing emissions with regard to the previous year was energy use in manufacturing industries and transport. Between the base year (1985-87) and 2005, fuel combustion, primarily in manufacturing industries but also in households and services and in energy industries, was the largest contributor to emission decreases. Emissions from agricultural soils also showed a strong decline.

**Emission projections:** Hungary will be far below the level of its Kyoto target in their projection. Emissions in 2005 were about 5 percentage points below the level projected in the 'with existing measures' and 'with additional measures' scenario for 2010.

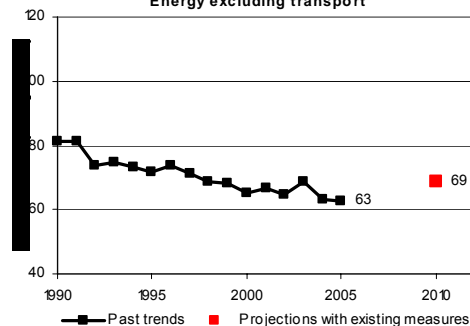
Emissions by sectors (2005)



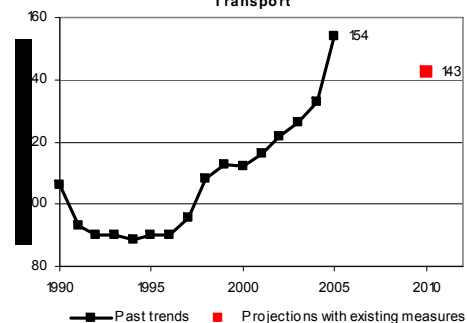
Emissions by sectors (2010)



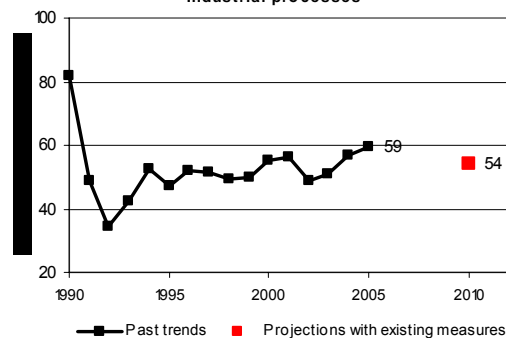
Energy excluding transport



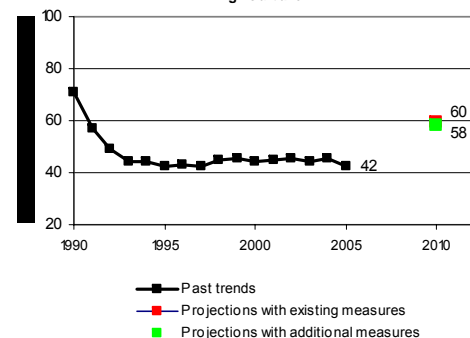
Transport



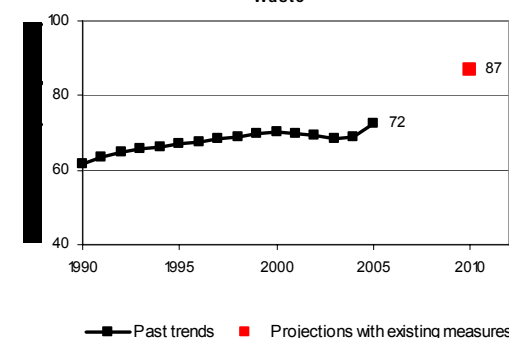
Industrial processes



Agriculture

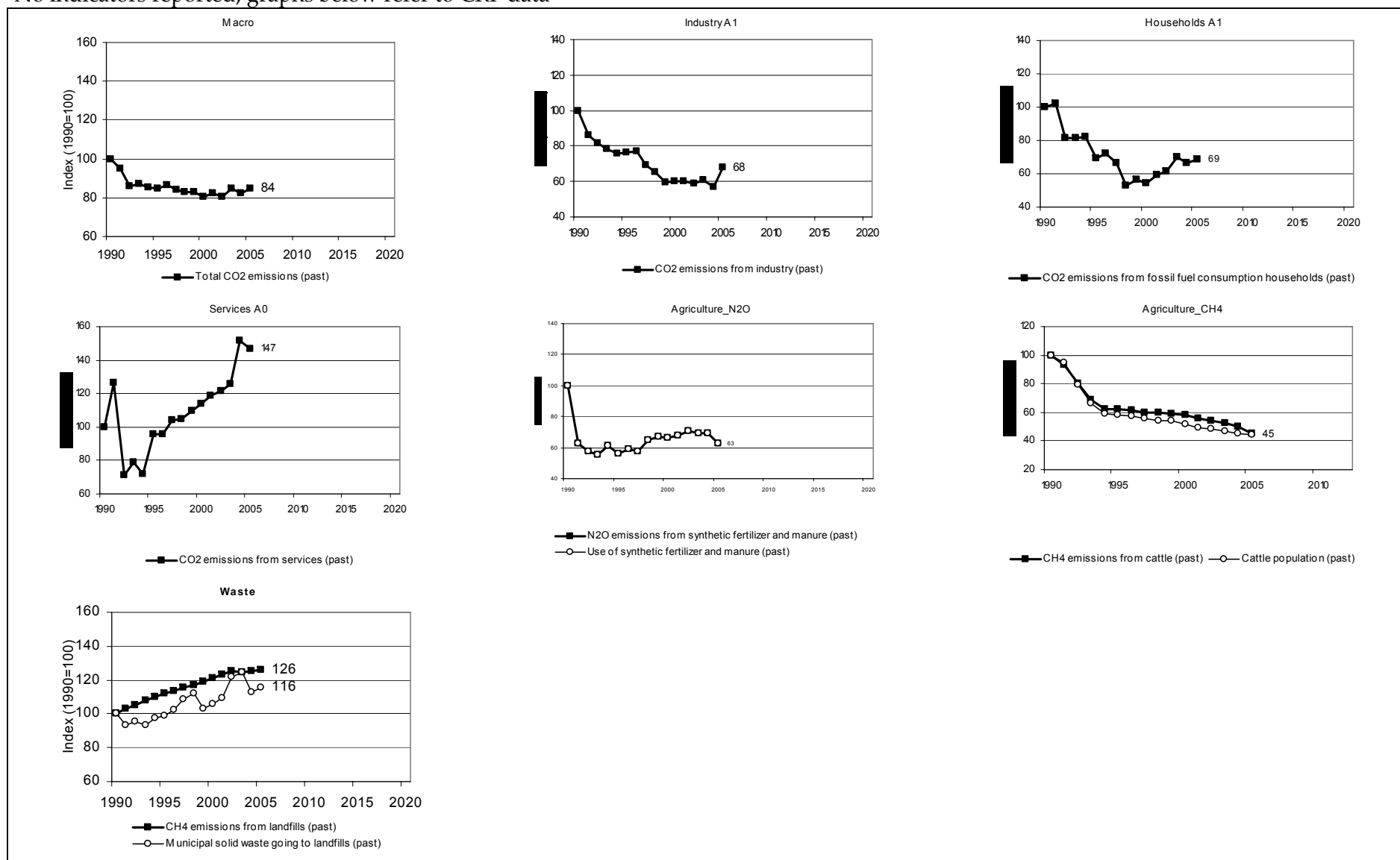


Waste



### 3. REPORTED INDICATORS

No indicators reported; graphs below refer to CRF data



#### 4. OVERVIEW OF CCPM IMPLEMENTATION IN MEMBER STATE

**Table 1. Information provided on the implementation of policies and measures**

Sector	CCPM	Status
Cross-cutting	Emissions trading 2003/87/EC	<b>N</b>
Cross-cutting	Kyoto Protocol project mechanisms 2004/101/EC	
Cross-cutting	Integrated pollution prevention and control 96/61/EC	
Energy supply	Promotion of cogeneration 2004/8/EC	<b>N</b>
Energy supply	Taxation of energy products 2003/96/EC	
Energy supply	Internal electricity market 2003/54/EC	
Energy supply	Promotion of electricity from RE sources 2001/77/EC	<b>N</b>
Energy supply	Internal market in natural gas 98/30/EC	
Energy supply	Emissions from large combustion plants 88/609/EEC	
Energy consumption	Directives on energy labelling of appliances	
Energy consumption	End-use efficiency and energy services 2006/32/EC	
Energy consumption	Ecodesign requirements for energy-using products 2005/32/EC	
Energy consumption	Energy performance of buildings 2002/91/EC	<b>N</b>
Energy consumption	Eco-management & audit scheme (EMAS) EC 761/2001	
Energy consumption	Energy-efficiency labelling for office equipment Regulation No. 2422/2001	
Energy consumption	Efficiency fluorescent lighting 2000/55/EC	
Energy consumption	Efficiency of hot water boilers 92/42/EEC	
Transport	Environmental performance freight transport (Marco Polo Programme)	
Transport	Motor challenge, voluntary EC programme	
Transport	Promotion of biofuels for transport 2003/30/EC	<b>N</b>
Transport	Integrated European railway area (2 <sup>nd</sup> + 3 <sup>rd</sup> Railway package) (COM(2002)18 final)	
Transport	Transport modal shift to rail 2001/12/EC etc.	
Transport	Consumer information on cars 1999/94/EC	
Transport	Agreement with car manufacturers ACEA etc.	
Industrial Process	F-gas regulation (Regulation No 842/2006)	
Industrial Process	HFC emissions from air conditioning in motor vehicles 2006/40/EC	
Agriculture	Support under CAP (1782/2003)	
Agriculture	Support under CAP - amendment (1783/2003)	
Agriculture	Nitrates 91/676/EEC	<b>N</b>
Agriculture	Transition to rural development support No 2603/1999	<b>N</b>
Agriculture	Agricultural production methods compatible with environment Regulation (EEC) No 2078/92	
Agriculture	Aid scheme for forestry measures in agriculture (Regulation (EEC) No 2080/92)	
Agriculture	Emission by engines to power agricultural or forestry 2000/25/EC	
Agriculture	Pre-accession measures for agriculture and rural development Regulation (EC) No 1268/1999	

Waste	Directive on waste 2006/12/EC	
Waste	Landfill directive 1999/31/EC	
Waste	Packaging and packaging waste (Directive 94/62/EC, 2004/12/EC, 2005/20/EC)	

*Legend*

<b>New national PAM implemented after CCPM was adopted</b>	<b>N</b>
<b>Existing national PAM re-enforced by CCPM</b>	<b>R</b>
<b>National PAM already in force before CCPM was adopted</b>	<b>B</b>
<b>Not reported</b>	

Source: MS responses to the CCPMs questionnaire, 2005. Personal communications.

## 5. COMPLETENESS OF REPORTING

Two chapters in the Fourth National Communication of Hungary deal with projections and measures. Policies and measures to reduce greenhouse gas emissions are presented for the Energy, Agriculture and Forestry sectors. Reporting is transparent. Summary tables are provided, either for measures or for projections (baseline, “with measures” and “with additional measures”).

**Table 2. Information provided on policies and measures**

Information provided	Level of information provided	Comments
Policy names	+++	
Objectives of policies	+++	
Which greenhouse gases?	+	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
Status of Implementation	++	
Implementation body specified	++	
Quantitative assessment of implementation	+++	Estimated mitigation effect for 2005, 2010 and 2015
Interaction with other policies and measures discussed	++	In some cases

+, ++, +++ level of information available increases as the number of + signs increases

**Table 3. Information provided on projections**

Category of Information	Level of information provided	Comments
Scenarios considered	+++	Baseline, With measures and With additional measures Scenarios are given for sectors corresponding with IPCC sectors and gases.
Expressed relative to base year	+++	
Starting year	0	
Split of projections	++	Projections split by IPCC sectors and gas but not by gas and sectors simultaneously
Presentation of results	++	Tables and figures

Description of model (level of detail, approach and assumptions)	++	Basic description of the models and further references provided
Sensitivity analysis (key inputs to model / high, central and low projections scenarios / robustness of model)	o	No information
Discussion of uncertainty	o	limited
Details of parameters and assumptions	+	Some information on type of indicators used in scenarios provided, situation across sectors differs

## 6. ASSESSMENT OF POLICIES AND MEASURES

**Table 4. Summary of the effect of policies and measures included in the 2010 projections (Mt CO<sub>2</sub>-eq.)**

	With measures	With additional measures
Energy (total, excluding transport)	0.0	0.0
Energy supply	NE	NE
Energy – industry, construction	NE	NE
Energy – other (commercial, residential, agriculture)	NE	NE
Transport (energy)	0,9	0,0
Industrial processes	0,0	0,0
Waste	0,0	0,0
Agriculture	0,0	0,0
Cross-sectoral	0,1	0,3
<b>Total (excluding LULUCF)</b>	<b>1.0</b>	<b>0.3</b>

The effect of policies implemented or adopted is derived from the sum of the potentials of the individual scenarios comparing *without* and *with measures*.

**Table 5. Detailed information on policies and measures**  
**Policies and measures in the “with measures” projection**

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
Energy supply	<a href="#">Energy tax and environmental levy</a>	Incentives for energy saving, funding for nature conservation. Incorporate some of the external costs of energy use in the price of energy.	<b>CH4</b> <b>CO2</b>	fiscal	implemented	Others(Hungarian Customs and Finance Guard (VPOP) State Tax Authority (APEH))			
Energy supply	<a href="#">Emission Trading</a>	Reduction of CO2 emissions from industry	CO2	economic	implemented	National Government			Cross-cut: Emissions trading scheme (Dir 2003/87/EC)
Energy supply	<a href="#">Support of cogeneration</a>	Increase the share of combined heat and power generation	CO2	Economic regulatory	implemented	Others(Hungarian energy office)	719		En. supply: Promotion of cogeneration (Dir 2004/8/EC)
Energy supply	<a href="#">Support of renewable based power generation</a>	Promote renewables in order to meet EU targets	CO2	Economic regulatory	implemented	Others(Hungarian energy office)	1,033		En. supply: Electricity production from renewable energy sources (Dir 2001/77/EC)
Energy supply	<a href="#">Life extension of the Paks nuclear plant</a>	Extend nuclear based power generation for at least 20 years	CO2	other		Companies / Businesses / industrial associations (Paks nuclear plant)			
Energy supply	<a href="#">Support of end user renewables</a>	Larger share of renewables	CO2	economic	implemented	Others(Energy centre)	38		
Energy supply	<a href="#">Limitation of SO2 emissions from power plants</a>	Reduce air pollution	CO2	regulatory	implemented	Regional Entities(Regional environmental	980		



Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
Energy supply	Act on Electricity	Regulation of power market	CO2	regulatory	implemented	inspectorates) National Government			
Energy consumption	New legislation for the energy efficiency of buildings	Reduced energy consumption for space heating	CO2	regulatory		National Government(Authorities for construction licences (municipalities) National Office for Housing and Construction (OLÉH))	97		En. consumption: Energy performance of buildings (Dir 2002/91/EC)
Energy consumption	Improving energy awareness	Increased energy awareness of the public leading to concrete savings	CO2	information	implemented	Others(Energy centre)			
Energy consumption	R&D for energy efficiency and renewables	Improved R&D with emphasis on energy efficiency and renewable energy	CO2 CH4	research	implemented	National Government(Ministry of Education (earlier) National Office for Research and Technology (from 2004) Energy Centre)	63		
Energy consumption	Support for the improvement of industrial energy efficiency	Reduced energy consumption in industry;	CO2	economic	implemented		63		
Energy consumption	Support for the improvement of residential/communal energy efficiency	Reduced energy consumption in the residential and communal sector	CO2	economic	implemented	Others(Energy Centre)	31		
Energy consumption	Modernising district heating systems	Improved efficiency in district heating	CO2	economic	implemented	Others(Energy Centre)	114		
Energy	UNDP Energy	Improvement of	CO2	economic	implemented	National Government			

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
consumption	efficiency programme for Municipal Energy Conservation	municipality energy management							
Energy consumption	EHA - Energy Saving Loan Fund (German Coal Aid)	Achieve energy saving which contribute to the reduction of the energy demand and the energy costs of the national economy efficiently	CO2	economic	implemented	National Government			
Energy consumption	Phare Co-Financed Energy Efficiency Loan Construction	Provide the financial incentive for developments focusing on the improvement of energy efficiency.	CO2	economic	implemented	National Government			
Energy consumption	<a href="#">National Energy Saving Programme (SZT-EN, NEP)</a>	Increase energy efficiency	CO2	economic	implemented	National Government			
Energy consumption	<a href="#">KIOF-2004-1.7.0.f (Operative Programme for the Environment and Infrastructure Environmental friendly development of energy management for 2004-2006)</a>	Increased utilisation of renewable energies; improved energy efficiency.	CO2	economic	implemented	National Government			
Energy consumption	<a href="#">Support for the energy efficient</a>		CO2	economic	implemented	National Government			

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
n	<a href="#">reconstruction or modernisation of pre-fab technology buildings ("Panel Programme" Code: LKFT-2005-LA-2)</a>								
Energy consumption	<a href="#">Hungarian Energy Efficiency Co-Financing Programme (HEECP)</a>		CO2	economic	implemented	National Government			
Transport	<a href="#">National targets and support for renewable automotive fuels</a>	Increased share of automotive biofuels	CO2	fiscal	implemented	National Government(Ministry of Economic Affairs and Transport, Ministry of Environment and Water Management, Ministry of Agriculture and Rural Development, Ministry of Finance)			Trans: Biofuels Directive (Dir 2003/30/EC)
Transport	<a href="#">General Transport related policies and measures</a>	Reduce urban environmental problems due to traffic	CO2	economic	implemented	National Government	925		
Agriculture	<a href="#">Land-based support for energy crops and forests</a>	To promote environment-friendly development of agriculture; rationalisation of land use and to assist to the realignment of	CO2	economic	implemented	National Government(Ministry of agriculture and rural development)			Agri: Agricultural production methods compatible with environment (Reg (EEC) No

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
Agriculture	The SAPARD Plan of Hungary (2000 – 2006)	rural areas. Reducing the negative impacts of agriculture on the environment	CO2	regulatory	implemented	National Government(Ministry of agriculture and rural development)			2078/92) Agri: Agricultural production methods compatible with environment (Reg (EEC) No 2078/92)
Agriculture	Nitrate Action Programme	Protection of waters against pollution caused by nitrates from agricultural sources.	N2)	regulatory	implemented	National Government(Ministry of agriculture and rural development)			Agri: Nitrates Directive (Dir 91/676/EEC)
Agriculture	Agriculture and Rural Development Operative Programme (AVOP)	Environmentally friendly agriculture and the rational use of land; Environment-conscious and sustainable land use; Improvement of the status of the environment; Increasing afforestation.	CO2	regulatory	implemented	National Government(Ministry of agriculture and rural development)			
Agriculture	Second National Environmental Programme - Thematic Action	Broad environmental objectives	CO2	regulatory	implemented	National Government(Ministry of agriculture and rural development)	57		
Agriculture	Entry Level Scheme (ELs)	Promote environmentally friendly farm management in each land use type to provide broad scale	CO2	economic	implemented	National Government(Ministry of agriculture and rural development)			

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
		opportunity to farmers to enter commitments to reach environmental achievements in their farming practice							
Agriculture	Organic Farming Scheme	Encourage farmers using conventional farming methods to convert their production systems to organic production	CH4 CO2	regulatory	implemented	National Government(Ministry of agriculture and rural development)			
Agriculture	Integrated Crop Management System (ICMS)	Environmentally beneficial extensification, especially the reduced, optimised use of fertilisers and pesticides, the considered (limited) application of dangerous substances and other accompanying benefits for the environment	CH4 cO2 N2O	economic	implemented	National Government(Ministry of agriculture and rural development)			
Agriculture	Support for meeting standards	Ensure that the requirements of the valid standards animal husbandry are met.	CH4	economic	implemented	National Government(Ministry of agriculture and rural development)			
Forestry	National Afforestation Programme	Increasing the area of forests	CO2	planning	implemented	National Government(Ministry of agriculture and rural development)	630		

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (ktCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
Forestry	<a href="#">National Rural Development Plan and AVOP</a>	Increasing the area of forests	CO2	planning		National Government(Ministry of agriculture and rural development)			
Forestry	<a href="#">National Agri-environment Programme</a>	Increasing the area of forests	CO2	planning	implemented	National Government(Ministry of agriculture and rural development)			
Forestry	<a href="#">Act LIV of 1996 on the forests and their protection</a>	Increasing the area of forests	CO2	economic	implemented	National Government(Ministry of agriculture and rural development)			
Waste	<a href="#">Act XLIII of 2000 on waste management</a>	Create a framework for waste management that serve a reduction of energy and raw materials consumption by improving efficiency and reducing the volume of waste.	CH4 N2O	regulatory		National Government(Ministry environment and water)			
Waste	<a href="#">National Waste Management Plan (NWMP)</a>	Reduction of waste amounts and biodegradable amounts landfilled, increased use of sludge	CH4 N2O	Regulatory economic		National Government(Ministry environment and water) Municipalities / local governments(Municipalities) Others(Regional environmental inspectors)			

### Policies and measures in the “with additional measures” projection

Sector	Name	Objective	Type of GHG affected	Type of instrument	Status	Implementing entity	Estimated savings (MtCO <sub>2</sub> -eq.)		Related CCPM
							2010	2020	
Agriculture	<a href="#">National Agri-Environmental Programme (NAEP)</a>	Support of agricultural production methods that are environmentally friendly	<b>CO2</b> <b>CH4</b> <b>N2O</b>		planned	National Government (Ministry of agriculture and rural development)			Agri: Support for rural development (Reg (EC) No 1783/2003 amending a number of other Regulations)

Note: There are no WM and WAM indicated, so implemented, adopted PaMs are listed under WM, and planned PaMs are listed among WAM. When there is no status indicated at all, it is also listed under WM.

Source: Öko Institut, (accessed June 2007), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>





## 7. EVALUATION OF PROJECTIONS

Table 6. Summary of projections by gas in 2010 (Mt CO<sub>2</sub>-eq.)

	Base-year	With measures	With additional measures
Carbon dioxide (excl. LULUCF)	84,8	NE	NE
Methane	13,3	NE	NE
Nitrous oxide	23,8	NE	NE
HFCs	0,0	NE	NE
PFCs	0,3	NE	NE
SF <sub>6</sub>	0,1	NE	NE
<b>Total (excl. LULUCF)</b>	<b>122,2</b>	<b>87,4</b>	<b>87,1</b>
% change relative to base year (excl. LULUCF)		-28,5%	-28,8%

Base year is the average of 1985-87 for all GHGs, except for F gases, which is 1995

Table 7. Summary of projections (6 gas basket) by sector in 2010 (Mt CO<sub>2</sub>-eq.)

	Base-year	with measures	% change relative to base-year	with additional measures	% change relative to base-year
Energy (total, excluding transport)	78.3	53.7	-31%	53.7	-31%
Energy supply	NE	NE		NE	
Energy – industry, construction	NE	NE		NE	
Energy – other (commercial, residential, agriculture)	NE	NE		NE	
Transport (energy)	8,0	11,4	43%	11,4	43%
Industrial processes	10,1	5,7	-44%	5,7	-44%
Solvent	0,4	0,0	-100%	0,0	-100%
Waste	5,4	4,7	-13%	4,7	-13%
Agriculture	20,0	11,9	-41%	11,6	-42%
<b>Total (excl. LULUCF)</b>	<b>122,2</b>	<b>87,4</b>	<b>-28%</b>	<b>87,1</b>	<b>-29%</b>

Base year is the average of 1985-87 for all GHGs, except for F gases, which is 1995

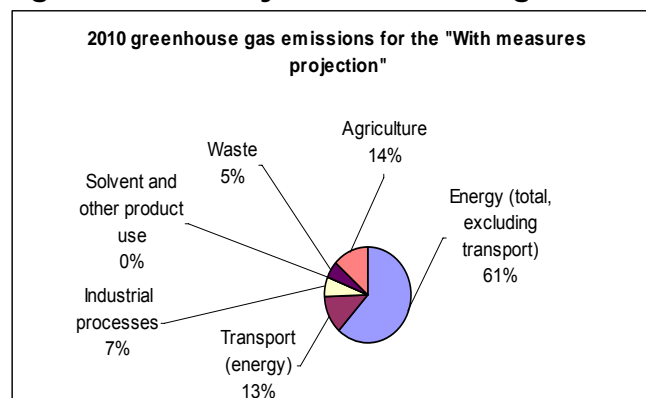


**Table 8. Summary of projections by sector and by gas in 2010 (Mt CO<sub>2</sub>-eq.) compared to base-year emissions**

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF <sub>6</sub> , HFCs and PFCs)		
	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures	Base year	With measures	With additional measures	Base-year	With measures	With additional measures
Energy (excl. transport)												
Transport (energy)												
Industrial processes												
Solvents												
Waste												
Agriculture												
<b>Total (excl. LULUCF)</b>	<b>84.8</b>	<b>NE</b>	<b>NE</b>	<b>13.3</b>	<b>NE</b>	<b>NE</b>	<b>23.8</b>	<b>NE</b>	<b>NE</b>	<b>0.4</b>	<b>NE</b>	<b>NE</b>

No projection data were reported by sector and by gas

**Figure 1. Share by sector of 2010 greenhouse gas emissions according to the "With existing measures" projections**



**Table 9. Summary of projections (6 gas basket) in 2010, 2015 and 2020 (Mt CO<sub>2</sub>-eq.)**

	Base-year*	2010	2010 % of base- year level	2015	2015 % of base- year level	2020	2020 % of base- year level
Total (excl. LULUCF)	122.3	87.1	71.3%	89.204	73.0%	92.634	75.8%

Source: Hungary's Fourth National Communication under the United Nations Framework Convention on Climate Change, 2006. WAM scenario was used

**Table 10. Assessment of the target (6 gas basket), with a comparison of 2010 projections in 2005, 2006 and 2007 national reports**

Emissions in MtCO <sub>2</sub> -equiv., excluding LULUCF				
	2010 projections from 2005	2010 projections from 2006	2010 projections from 2007	2010 projections from 2007, % of base year level
Base year emissions used for projections	101.7	122.3	122.3*	100%
Kyoto Commitment/burden sharing	95.598	114.868	114.9	-6.0%
With existing P&Ms projections	95.6	87.4	87.4	71.5%
Gap (-ve means overachievement of target)	0.0	-27.5	-27.5	-22.5%
With additional P&Ms projections	95.6	87.1	87.1	71.2%
Remaining gap	0.0	-27.8	-27.8	-22.7%
Effect of flexible mechanisms	0.0	0.0	0.0	0.0%
Remaining gap (with use of flexible mechanisms)	0.0	-27.8	-27.8	-22.7%

Above table excludes LULUCF. LULUCF will be covered in the main report, based on the questionnaire submissions

Hungary is not planning to utilize the effect of flexible mechanisms to achieve target.

Source for 2005 is Hungary's Third National Communication under the United Nations Framework Convention on Climate Change, 2001. Source for 2006 data is Hungary's Fourth National Communication under the United Nations Framework Convention on Climate Change, 2006. Updated projections were not reported by 31st May 2007.

\*Base year data differs slightly from data reported in The European Community's initial report under the Kyoto Protocol - Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol (Submission to the UNFCCC Secretariat), EEA Technical report No 10/2006 (123.03 MtCO<sub>2</sub>-eq). This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

**Table 11. Comparison with projections for the trading sector (EU ETS)**

	NC4	NAP 2 projections	Difference
Energy sector	65.113 <sup>a</sup>		
Energy sector included in EU ETS	53.709 <sup>b</sup>	21.1	- 60.7 %
Industry sector	5.724 <sup>c</sup>		

Industry sector included in EU ETS	5.107 <sup>d</sup>	9.608	88.1 %
Total Energy & Industry	70.837	30.733*	- 56.6 %

\*The figure shows cap excluding reserves. The proposed cap by Hungary including all kind of reserves is 30.733 Mt CO<sub>2</sub> eq, which was not approved. The EC adopted 26.9 Mt CO<sub>2</sub> annually, it is 12.4 % lower than proposed. NC4 projections are based on old calculations, WM scenario was used

Energy use from industry is normally included in the energy sector for projections under the UNFCCC and included in the industry sector for NAP 2 projections. Due to these and other differences in the sector definitions projections for the individual sectors might not be comparable.

<sup>a</sup> Included are total GHG missions from energy production including transport (industry is excluded)

<sup>b</sup> Included are total GHG emission as above excluding transport part of energy production

<sup>c</sup> Included are total GHG emissions from the industrial sectors

<sup>d</sup> Included are total GHG emissions from the industrial sectors as mineral products and production of ferrous metals (chemical is excluded)

## 8. DESCRIPTION OF MODELLING APPROACH

In order to significantly improve the quality and reliability of the entire Hungarian GHG inventory and reporting system major changes were introduced last year. Besides several institutional changes it was decided that a new basic research founding the emission projections and new forecasts will be made. For this reason two calls for tenders are issued for the necessary basic research and GHG projections. As a consequence of the process the previous model and projections were not revised, the projections will be based on the same set of conditions and modelling methodology. In the review of the key input data, however, the new trends are described and those data are presented which will form the basis of the new projections after the tendering process is closed, most likely in September 2007.

The forecasts for non-GHGs and CO<sub>2</sub> are provided for each year in the period: 2005-2020. In forestry the CASMOR model was used. Few indicators for projections were provided.

## 9. PROJECTION INDICATOR REPORTING

Not reported.

## 10. REPORTING OF PARAMETERS ON PROJECTIONS

Not reported.

Table 12. Indicators for projections to monitor and evaluate progress with policies and measures (2005/166/EC) Annex III

N°	Eurostat Sectors	Indicator	2005 2010 2015 2020				Numerator/denominator	2005 2010 2015 2020					
			2005	2010	2015	2020		2005	2010	2015	2020		
1	Macro	CO <sub>2</sub> intensity of GDP, t/Euro million					Total CO <sub>2</sub> emissions, kt GDP, bio Euro (EC95)						
2	Transport C0	CO <sub>2</sub> emissions from passenger cars, kt Number of kilometres by passenger cars, Mkm											
3	Transport D0	CO <sub>2</sub> emissions from freight transport (all modes), kt Freight transport (all modes), Mtkm											
4	Industry A1	Energy related CO <sub>2</sub> intensity of industry, t/Euro million					CO <sub>2</sub> emissions from fuel consumption industry, kt Gross value-added total industry, Bio Euro (EC 95)						
5	Households A1	Specific CO <sub>2</sub> emissions of households, t/dwelling					CO <sub>2</sub> emissions from fossil fuel consumption households, kt Stock of permanently occupied dwellings, 1000						
6	Services A0	CO <sub>2</sub> intensity of the services sector, t/Euro million					CO <sub>2</sub> emissions from fossil fuel consumption services, kt gross value-added services, bio Euro (EC95)						
7	Transformation B0	Specific CO <sub>2</sub> emissions of public and autoproducer power plants, t/TJ					CO <sub>2</sub> emissions from public and autoproducer thermal power stations, kt all products-output by public and autoproducer thermal power stations, PJ						
8	Agriculture	Specific N <sub>2</sub> O emissions of fertilizer and manure use, kg/kg					N <sub>2</sub> O emissions from synthetic fertilizer and manure use, kt use of synthetic fertiliser and manure, kt nitrogen						
9	Agriculture	Specific CH <sub>4</sub> emissions of cattle production, kg/head					CH <sub>4</sub> emissions from cattle, kt cattle populations, 1000 head						
10	Waste	Specific CH <sub>4</sub> emissions from landfills, kt/kt					CH <sub>4</sub> emissions from landfills, kt Municipal solid waste going to						

							landfills, kt				
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**Table 13. List of parameters on projections (Annex IV of Implementing Provisions<sup>1</sup>)**

<b>1. Mandatory parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for general economic parameters</b>				
GDP (value at given years or annual growth rate and base year)				
Population (value at given years or annual growth rate and base year)				
International coal prices at given years in euro per tonne or GJ (Gigajoule)				
International oil prices at given years in euro per barrel or GJ				
International gas prices at given years in euro per m3 or GJ				
<b>Assumptions for the energy sector</b>				
Total gross inland consumption (PJ) (split by oil, gas, coal, renewables, nuclear, other)				
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)				
Energy demand by sector split by fuel (delivered)				
Assumptions on weather parameters, especially heating or cooling degree days				
<b>Assumptions for the industry sector</b>				
<i>For Member States using macroeconomic models:</i>				
The share of the industrial sector in GDP and growth rate				
<i>For Member States using other models:</i>				
The production index for industrial sector				
<b>Assumptions for the transport sector</b>				
<i>For Member States using macroeconomic models:</i>				
The growth of transport relative to GDP				
<i>For Member States using other models:</i>				
The growth of passenger person kilometres				
The growth of freight tonne kilometres				
<b>Assumptions for buildings (in residential and commercial or tertiary sector)</b>				
<i>For Member States using macroeconomic models:</i>				
The level of private consumption (excluding private transport)				
The share of the tertiary sector in GDP and the growth rate				
<i>For Member States using other models:</i>				
The rate of change of floor space for tertiary buildings and dwellings				
The number of dwellings and number of employees in the tertiary sector				
<b>Assumptions in the agriculture sector</b>				
<i>For Member States using macroeconomic models:</i>				
The share of the agriculture sector in GDP and relative growth				
<i>For Member States using other models:</i>				
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)				
The area of crops by crop type				
Emissions factors by type of livestock for enteric fermentation and manure management (t)				
<b>Assumptions in the waste sector</b>				
Waste generation per head of population or tonnes of municipal solid waste				
The organic fractions of municipal solid waste				
Municipal solid waste disposed to landfills, incinerated or				

<sup>1</sup> Commission Decision of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol

<b>1. Mandatory parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
composted (in tonnes or %)				
<b>Assumptions in the forestry sector</b>				
Forest definitions				
Areas of:				
managed forests				
unmanaged forests				

<b>2. Recommended parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for general economic parameters</b>				
GDP growth rates split by industrial sectors in relation to 2000				
Comparison projected data with official forecasts				
<b>Assumptions for the energy sector</b>				
National coal, oil and gas energy prices per sector (including taxes)				
National electricity prices per sector as above (may be model output)				
Total production of district heating by fuel type				
<b>Assumptions for the industry sector</b>				
Assumptions fluorinated gases:				
Aluminium production and emissions factors				
Magnesium production and emissions factors				
Foam production and emissions factors				
Stock of refrigerant and leakage rates				
<i>For Member States using macroeconomic models:</i>				
Share of GDP for different sectors and growth rates				
Rate of improvement of energy intensity (1990 = 100)				
<i>For Member States using other models:</i>				
Index of production for different sectors				
Rate of improvement or index of energy efficiency				
<b>Assumptions for buildings (in residential and commercial / tertiary sector)</b>				
<i>For Member States using macroeconomic models:</i>				
Share of tertiary and household sectors in GDP				
Rate of improvement of energy intensity				
<i>For Member States using other models:</i>				
Number of households				
Number of new buildings				
Rate of improvement of energy efficiency (1990 = 100)				
<b>Assumptions for the transport sector</b>				
<i>For Member States using econometric models:</i>				
Growth of transport relative to GDP split by passenger and freight				
Improvements in energy efficiency split by vehicle type				
Improvements in energy efficiency split by vehicle type, whole fleet/new cars				
Rate of change of modal split (passenger and freight)				
Growth of passenger road kilometres				
Growth of passenger rail kilometres				
Growth of passenger aviation kilometres				
Growth of freight tonne kilometres on road				
Growth of freight tonne kilometres by rail				
Growth of freight tonne kilometres by navigation				

<b>2. Recommended parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for the agriculture sector</b>				
<i>For Member States using econometric models:</i>				
Agricultural trade (import/export)				
Domestic consumption (e.g. milk/beef consumption)				
<i>For Member States using other models:</i>				
Development of area of crops, grassland, arable, set-aside, conversion to forests etc				
Macroeconomic assumptions behind projections of agricultural activity				
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)				
Development of farming types (e.g. intensive conventional, organic farming)				
Distribution of housing/grazing systems and housing/grazing period				
Parameters of fertiliser regime:				
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)				
Volatilisation rate of ammonia, following spreading of manure on the soil				
Efficiency of manure use				
Parameters of manure management system:				
Distribution of storage facilities (e.g. with or without cover):				
Nitrogen excretion rate of manures				
Methods of application of manure				
Extent of introduction of control measures (storage systems, manure application), use of best available techniques				
Parameters related to nitrous oxide emissions from agricultural soils				
Amount of manure treatment				

No parameters on projections were reported.

## 11. COUNTRY CONCLUSIONS

Hungary has a target of a 6% reduction in greenhouse gases relative to the base period (1985-1987). The projections submitted in NC4 indicate that Hungary will meet the Kyoto Commitment according to both scenarios (28.5% below the base year period “with measures” in 2010 and 28.8% for “with additional measures” scenario).

A detailed description of policies and measures was provided together with reduction impact assessment of individual policies and measures.

Hungary is in the process of developing new projections.