



Hungary's Initial Report under the Kyoto Protocol

Calculation of Assigned Amount

Hungarian Ministry for Environment and Water, 2006

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1. Introduction

As a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol Hungary has an obligation to submit a report determining assigned amount to the UNFCCC by 31 December 2006 latest. According to decision 10/CMP.1 Parties should submit their report determining their assigned amount 16 months before their eligibility for the use of international emission trading and ability to transfer and/or acquire ERUs under the joint implementation mechanism.

This requirement was also set down in Article 23 of a Commission decision laying down rules implementing Decision 280/2004/EC¹ of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol. This report represents fulfillment of Hungary's obligation under Article 23 and is submitted in accordance with the guidelines set out by the Commission Decision and relevant guidelines under the Kyoto Protocol.

This report contains the following information, or references to such information where it has been previously submitted to the secretariat with regard to Hungary:

1. Complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990, or the approved base period under Article 3, paragraph 5 of the Kyoto Protocol, to the most recent year available, prepared in accordance with Article 5, paragraph 2 of the Kyoto Protocol, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), taking into account any relevant decisions of the Conference of the Parties (COP);
2. Identification of its selected base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride in accordance with Article 3, paragraph 8 of the Kyoto Protocol;
3. Calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, on the basis of its inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol.
4. Calculation of its commitment period reserve in accordance with decision 11/CMP.1 (*Article 17*);
5. Identification of its selection of single minimum values for tree crown cover, land area and tree height for use in accounting for its activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol, together with a justification of the consistency of those values with the information that has been historically reported to the Food and Agriculture Organization of the United Nations or other international bodies, and in the case of difference, an explanation of why and how such values were chosen, in accordance with decision 16/CMP.1 (*Land use, land-use change and forestry*);

¹ Commission Decision of 10 February 2005 laying down rules implementing Decision 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 (2005/166/EC)

6. Identification of its election of activities under Article 3, paragraph 4 of the Kyoto Protocol, for inclusion in its accounting for the first commitment period, together with information on how its national system under Article 5, paragraph 1 of the Kyoto Protocol, will identify land areas associated with the activities, in accordance with decision 16/CMP.1 (*Land use, land-use change and forestry*);
7. Identification of whether, for each activity under Article 3, paragraphs 3 and 4 of the Kyoto Protocol, it intends to account annually or for the entire commitment period;
8. A description of its national system in accordance with Article 5, paragraph 1, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol;
9. A description of its national registry, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

2. Hungary's Greenhouse Gas Inventory

Pursuant to the UN Framework Convention on Climate Change (UNFCCC), Hungary has been preparing annual inventories of greenhouse gas emissions using the IPCC methodology. The average of 1985, 1986 and 1987 were selected as the base year. The base period is used as point of reference for the greenhouse gas reduction commitment, under which Hungary has undertaken to reduce the emissions by 6% in the first commitment period. As regards inventory preparation, Hungary switched to the method recommended by IPCC 1996 Revised Guidelines in 1998, and by the IPCC 2003 Good Practice Guidance in 2005-2006. Since then, the databases have been prepared in the Common Reporting Format (CRF).

During the evaluation of inventory, the Hungarian inventory team constantly faced problems in conjunction with the inconsistencies between the pre- and post-1998 data arising from the changed methodology. The recalculation of pre-1998 data started in 2003. In the first phase, data from the base years and from 1990 were processed and the corresponding CRF tables of GHG inventories were prepared. At the same time specific national emission factors were determined for a number of technologies thereby increasing the accuracy of the inventories. The recalculation project continued in 2004 and by early 2005, when a consistent time series including each of the years of 1985 through 2003 (19 years in total) was generated.

During the second phase of the recalculation project, several corrections were again made to the existing inventories in the light of new information to ensure the consistency of the time series.

Accordingly, Hungary's greenhouse gas emission inventory was developed in a number of phases before attaining its present form. To characterise the changes made, the table below shows the cumulative values (Gg CO₂eq, without LULUCF) indicated in the inventories at different time points.

	Base years	1988	1989	1990	1991	1992	1993	1994	1995
Year 2000, Submission 2002	101,633	--	--	86,628	87,905	79,078	78,974	77,161	77,916
Year 2001, Submission 2003	113,074	--	--	95,820	87,905	79,078	78,974	77,161	77,916
Year 2003, Submission 2005	121,606	117,897	114,715	103,619	95,714	85,685	85,439	85,196	83,984
	1996	1997	1998	1999	2000	2001	2002	2003	
Year 2000, Submission 2002	79,184	76,853	83,687	86,546	84,338	--	--	--	
Year 2001, Submission 2003	79,184	76,853	83,687	86,546	78,011	79,279	--	--	
Year 2003, Submission 2005	86,360	84,408	84,530	83,735	81,150	83,967	80,842	83,283	

2.1. Base year inventory and complete time series

Hungary's most recent inventory is the 2004 inventory, which has been modified and will be resubmitted in August 2006.

Changes in the inventory in comparison to the one submitted on 17 April 2006 are:

- The original 2004 submission contained soil CO₂ emissions according to the new GPG for LULUCF only for the year 2004, the recent one contains it comprehensively to the sequence of years from 1985-2004.
- The methodology in the Energy sector became further harmonised that instead of the earlier applied „mixed” emission factors, in major part fuel specific factors were applied. With this the accuracy of emission data from this sector increased. Along with this for the lignite mined in Hungary, based on the sequence of emission factor measuring for more than a year, 113.2 t/TJ value was applied instead of the 105.6 t/TJ for the whole time sequence.
- In the Agriculture sector the calculation referring to the base year were made more accurate.
- In Wastewater sector the missing data for base period was supplemented.

Due to these improvements the following changes were realised in the emissions trend.

(Total, excl. LULUCF, Gg CO₂eq):

Submission	Base year (1985-87)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
2006 April	122 257	122 985	121 484	122 301	117 477	114 347	103 375	95 392	85 231	84 989	84 940
2006 August	123 178	123 931	122 390	123 213	118 129	115 032	104 123	95 987	85 879	85 730	85 819
Difference	921	946	906	912	652	686	748	595	647	741	879

Submission	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
2006 April	83 557	85 947	84 031	84 115	83 786	81 046	83 803	80 815	83 268	83 112	
2006 August	84 384	86 792	84 854	84 503	84 174	81 904	84 575	81 584	84 363	83 953	
Difference	827	845	823	388	387	859	772	769	1 094	840	

The tables below provide the full time series and base period² data. They contain the modified values of the 2004 emission inventory (to be submitted in August 2006).

² For Hungary the base period is the average of the years 1985-1987, for fluorides 1995

[Gg CO2 eq]

GREENHOUSE GAS EMISSIONS	Base years	1988	1989	1990	1991	1992	1993	1994	1995
CO₂ (without LULUCF)	85 596	81 010	78 766	72 934	69 019	62 606	63 444	62 328	61 655
CH₄	13 385	13 682	13 555	11 949	11 418	10 784	10 063	9 889	10 052
N₂O	23 847	23 090	22 402	18 929	15 264	12 305	12 026	13 374	12 438
HFCs	NO	NO	NO	NO	NO	0.1	0.1	1	2
PFCs	268	264	285	271	234	135	146	159	167
SF₆	81	84	25	40	53	49	52	68	70
Total (including net CO₂ from LULUCF)	120409	114228	112594	100273	91 784	80 401	79 895	79 169	76 312
Total without fluorids:	122829								
Total fluorids:	349			311					239

	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO₂ (without LULUCF)	63 029	61 305	60 578	60 499	58 735	60 260	58 623	61 686	59 994
CH₄	10 170	10 075	10 387	10 010	10 101	10 356	9 760	9 520	9 162
N₂O	13 363	13 199	13 151	12 981	12 512	13 371	12 475	12 307	13 891
HFCs	2	45	125	347	206	281	404	499	526
PFCs	159	161	193	210	211	199	203	190	201
SF₆	69	68	68	127	140	107	120	162	178
Total (including net CO₂ from LULUCF)	81 667	80 149	79 316	82 621	78 656	80 093	77 001	79 496	78 405

An overview of the time series of emissions suggests that the national emission rates are significantly lower in comparison with the base years. More specifically, an abrupt drop occurred in the beginning of the period as a result of the significant reduction in the output of the national economy. Since the middle of the 1990s, annual emissions have been fluctuating around the level of 83,000 Gg.

Emissions were reduced in the Energy, Agriculture, Industry and Solvent sectors. The Waste sector shows a slight increase. In the Land-Use, Land-Use Change and Forestry (LULUCF) sector removals show a fluctuating but increasing tendency. The actual values are significantly influenced by the changes in the CO₂ balance of the soil.

As regards the trends of the emissions of different gases, CO₂, CH₄ and N₂O show decreasing tendencies. The reduction of CO₂ emission is particularly high although showing a fluctuating tendency in recent years.

As regards fluoride gases, the overall trend is an increasing one. Based on information from industrial operators, the domestic refrigerator manufacturing industry use of HFCs started in 1992, reached a peak in the end of the 1990s and has been constantly reduced since then. However, the total emissions show a constant increase.

3. Selected base year for hydroflourocarbons, perfluorocarbons and sulphur hexafluoride

Article 3.8 of the Kyoto Protocol reads “*any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride*” for the purposes of calculating its assigned amount in accordance with Article 3.7. In accordance with this, Hungary has chosen the year 1995 as the base year for the emissions of the hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF6).

4. Calculation of Hungary's Assigned Amount

The calculation of Hungary's assigned amount is based on the inventory submitted on 17 April 2006 with the modifications indicated in Chapter 2 of this report.

Based on Hungary's inventory report for the period of 1985-87 years and on the 6% reduction target of Hungary the assigned amount of Hungary is calculated as follows:

Hungary's Assigned Amount = {Base years emission in CO₂eq (average of 1985-87 excl. LULUCF-Fluorides_{base year}) + Fluorides₁₉₉₅} * the quantified emission limitation or reduction commitment established for Hungary in the Kyoto Protocol (94%, Appedix B of the Kyoto Protocol) * 5 years =

$$= \{(123\ 178\ 227-349\ 502)+238\ 716\} * 0.94 * 5 = \mathbf{578\ 416\ 973\ Mg\ CO_2eq}$$

5. Calculation of Hungary's commitment period reserve

The commitment period reserve is calculated in accordance with decision -/CMP.1 (Article 17) as 90% of the proposed assigned amount or 100% of its most recently reviewed inventory times five, whichever is the lowest.

Hungary has interpreted the “most recently reviewed inventory” to mean the inventory which was reviewed until the date of preparation of this report, which is the inventory submission of 2003.

Calculations:

a./ On the basis of assigned amount:

90% of the assigned amount of Hungary specified in Chapter 4.

$$0.9 * 578\,416\,973 = 520\,575\,276 \text{ Mg CO}_2\text{eq}$$

b./ On the basis of the most recent inventory (2004) :

$$83\,952\,541 * 5 = 419\,762\,705 \text{ Mg CO}_2\text{eq}$$

Based on the calculations above, Hungary's commitment period reserve for the first commitment period is **419 762 705 Mg CO₂eq**

6. Land use, land use change and forestry (LULUCF)

6.1. **Definition of forest for reporting under Article 3.3 and 3.4 of the Kyoto Protocol**

Article 3.3 of the Kyoto Protocol requires Parties in meeting their emissions reduction commitments to account for afforestation, reforestation and deforestation since 1990.

Regarding the definition of forest Hungary has chosen the following elements and single minimum values:

<i>Characteristics</i>	<i>Chosen value by Hungary</i>	<i>Justification</i>
Single minimum land area	0.5 ha	identical with value reported to FAO
Single minimum width of forest area	10 m	defined by the methodology of current forest inventory
A single minimum tree crown cover value between 10 and 30%	30%	identical with value reported to FAO
A single minimum tree height value between 2 and 5 meters	5 m	identical with value reported to FAO

7. Selection of activities under Article 3.4 of the Kyoto Protocol

Article 3.4 of the Kyoto Protocol allows Parties flexibility to choose Forest Management, Cropland Management, Grazing Land Management and Revegetation towards meeting commitment, but this is not mandatory.

Hungary selects Forest Management as an activity under article 3.4, but does not elect Cropland Management, Grazing Land Management and Revegetation towards meeting its commitment.

7.1. Method for identification of land areas associated with LULUCF-activities

On Forest management activities the national system under Article 5.1 of the Kyoto Protocol is compiled with the support of the State Forestry Service and the Ministry of Agriculture and reported to the core team maintaining the national system according to article 5.1 of the Kyoto Protocol.

Information on forest type and planting/deforestation date: the data source is the computerised National Forestry Database, which is based on property boundary system digital map, operated and continuously updated by the State Forestry Service.

Geographical location of forests: maps and complementary information of the National Forestry Database.

Method to distinguish deforestation from areas harvested and replanted: inventory data from the National Forestry Database integrated with necessary mapping information, the yearly updated forest management plans, as well as data from forestry inspections along with criteria

- (1) decisions on authorized deforestations, and
- (2) species and site specific time limits for regenerations.

7.2. Accounting for activities under Article 3.3 and 3.4 of the Kyoto Protocol

Hungary intends to account for Article 3.3 and 3.4 (Forest Management only) LULUCF activities annually as it gives a possibility for a more frequent monitoring and accounting based on the best possible data through the whole commitment period.

8. Hungary's national system for climate reporting

8.1. *Background*

Under article 5 of the Kyoto Protocol, each party in Annex I has to introduce a national system for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol by 1 January 2007.

Under UNFCCC decision 20/CP.7, the national system has to ensure the function of all the institutional, legal and procedural arrangements required to calculate emissions and removals of greenhouse gases. Furthermore, under the rules of Decision 280/2004/EC of the European Parliament and of the Council, the national system has also to be in place.

The aim of the Hungarian national system is to ensure that climate related reporting to the UNFCCC Secretariat and the European Commission complies with specified requirements.

8.2. *Legal arrangements*

Hungary has a system of data collection relying upon legislation set up for other purposes. With the introduction of the emission trading system and its legal framework its data quality and the speed of its availability improved significantly for emission sources responsible for approximately half of the greenhouse gas emissions.

The Act on Implementation of the Kyoto Protocol, which is in preparation *inter alia* aims to reframe this system and gives direct data collection authorisation to the Ministry for Environment and Water in order to collect data for the national system for climate reporting and will give a permanent status to the system. It will also describe the roles of various government agencies in the maintenance of the system in line with the quality principles defined in relevant UNFCCC and IPCC documents.

8.3. *Institutional arrangements*

The Minister for Environment and Water has overall responsibility for the Hungarian Greenhouse Gas Inventory and the Hungarian National System for climate reporting. It is responsible for the institutional, legal and procedural arrangements for the national system and for the strategic development of the national inventory. The supervision of the system is done by the Climate Change Unit of the Ministry.

The National System is based in the Hungarian Meteorological Office, where a core expert team is supervising the maintenance of the system and prepares the greenhouse gas inventories and other reports with the involvement of external institutions and experts on a contractual base.

A computerised database containing the data relevant to the National System as well as for the EU emission trading regime is in development. Further development of the system may

include the incorporation of other emission data, which are relevant to air pollution. The system will have regular backup for data.

To enable the core expert team to draw up the yearly inventory report and other reports to the UNFCCC and the European Commission it co-ordinates its work with other involved ministries, government agencies, consultants, universities and companies.

Major institutions in terms of data provision

<i>Institution</i>	<i>Tasks</i>	<i>Sector</i>
Nature Conservation Office, Ministry for Environment and Water	<ul style="list-style-type: none"> Data collection. Providing help in compiling the forest inventory. 	Forests, LULUCF
Development Directorate, Ministry for Environment and Water	<ul style="list-style-type: none"> Providing data of HIR (waste management information system) and VAL. 	Waste
Division for Emission Trading, National Inspectorate for Environment, Nature and Water	<ul style="list-style-type: none"> Providing relevant data from the certified reports of the installations subject to the scope of the Government Decree No. 272 of 2004 (IX. 29.) (actors of the EU ETS); the data go into the energy and industry sectors part of the national inventory. 	Industry, energy
VÁTI (Hungarian Public Nonprofit Company for Regional Development and Town Planning)	<ul style="list-style-type: none"> Checking the data of the data provision subject to the scope of the Government Decree No. 21 of 2001 (II. 14.). 	Energy Industry Solvents
Industry Alliances, emitters	<ul style="list-style-type: none"> Collection and evaluation of data belonging to industry sectors. Providing data for estimating the emissions of the industry sector in the national inventory. 	Industry
Hungarian Central Statistical Office	<ul style="list-style-type: none"> Providing the basic data for estimating the emissions of each sector. Providing checking data for estimating the emissions of each sector. 	All sectors
Hungarian Energy Office	<ul style="list-style-type: none"> Data provision. Compiling energy statistics. 	Energy
State Forest Service	<ul style="list-style-type: none"> Providing data for estimating the emissions and capturing belonging to the afforestation part of the national inventory. 	Forests
Ministry of Agriculture and Rural Development	<ul style="list-style-type: none"> Data provision. 	LULUCF

8.4. Procedural arrangements

The national system team operates on the basis of the internal rules of the National System laid down by the Minister for Environment and Water which will be superseded by the rules to be laid down by the Act on implementation of the Kyoto Protocol and its executive orders.

A steering committee of prominent sectoral experts and government representatives is proposed to be set up in late 2006. The council is dedicated to promote dialogue in order to improve data quality and methodology applied through the activities of the national system and would consider and approve the national inventory prior to submission to the UNFCCC.

The annual inventory cycle is carried out in accordance with the principles and procedures set out in the IPCC (1996) Guidelines and the IPCC Good Practice Guidance.

8.4.1. Annual Inventory Cycle

The annual inventory starts in August each year and contains the following elements:

Data collection and processing

Data collection happens in several ways and throughout the whole yearly cycle of the inventory. Sector specialists of the core team are making the data inquiry and collection with the assistance of the Ministry for Environment and Water. Data are collected primarily from the emitter if it is possible (especially in the case of power stations, heating stations and industrial technologies) and statistical databases are used only as secondary source of information – which is used especially in the case of agriculture, LULUCF and waste management sectors.

Method and emission factor selection

The calculation method – allowing for a few exceptions – was chosen by taking into account the technologies that can be found in Hungary and according to the recommendations of the IPCC Guidelines. The calculation of the emissions occurred by using the formula of activity X emission factor where the activity data can be raw material or product or even primary product. In several cases emissions were determined in a different way, on the basis of other information. At the emission factors the default values were used in the beginning and the emission factors characteristic of the domestic technologies were gradually determined and these ones started to be used.

Preparation of emission estimates

After the preliminary compliance assessment of the basic data the consulting the core team carries out the necessary calculations, they compile the database of the sectors under their supervision and after repeated checks they unify the sectoral data in the CRF Reporter program.

Uncertainty assessment

The uncertainty values of the entire inventory are calculated on the basis of the emission uncertainty data of the activities and with the help of the method provided in the GPG.

Key source categories

The key source categories are determined by the method provided in the GPG at Tier 1 level and also at Tier 2 level, as soon as the uncertainty data become available.

Recalculations

The emission calculation procedures and factors were chosen earlier, the team uses the same methods year by year. Should such new information emerged that improved the quantity, quality or accuracy of the emission data then we would use the improved method, more precise activity data or more characteristic emission factors for recalculation.

Reporting

Collaterally with the compilation of the database but at the completion thereof the inventory report will be established with the content approved by the COP. In this report the steps of inventory-making, the basic data, the chosen calculation method are to be presented, the results and the emission trends will be assessed, etc.

Review

At the reviews performed by the UNFCCC Secretariat necessary information is provided, react the problems arisen and we perform the recalculation or compile the next inventory by taking into account the reflections and proposals known by the team.

Archiving

A copy of all data, information necessary to the compilation of the given annual inventory are stored in a printed or electronic form by the expert team and indexed for later retrieval or search. The studies grounding the calculation that differ from the default method to a significant extent are deposited at the expert team in the Hungarian Meteorological Office.

10. Art. 8 reviews

Expert reviews will be conducted yearly. The review teams will receive full access to the data and documents used the preparation of the inventory and other reports and the team (internal and external experts) responsible for the preparation of the given report will be available for inquiries.

Verification

The verification of the inventories already begins in the data collection stage. Data are verified by comparing several databases, in other cases the received information are checked by statistical data. Verification is performed by the experts and the compiler of the inventory on the one hand on the basis of the already long time series and on the other hand by comparing with the emission database.

8.4.2. QA/QC information

The national system has to ensure high quality in the inventory, i.e. to ensure that the inventory is transparent, consistent, comparable, complete and accurate. These terms are defined in the UNFCCC guidelines on yearly inventories (FCCC/CP/2002/8). These principles guide the internal expert team maintaining the system.

The external experts involved in inventory preparation have prepared or have participated in the preparation of national databases (emission databases, pollution databases) for several years and members of the team have “expert permissions” issued by the Minister for the Environment and Water, which were only granted to staff members with sufficient experience and trustworthiness. New team members are subject of thorough on hand training which lasts for two inventory circles.

The plan of an overall QA/QC system covering the entire process of inventory preparation is being developed and is expected to be completed in 2006. One member of the National System team has a designated role to supervise the quality assurance in all work phase.

The national system’s quality system is based on the structure described in UNFCCC decision 19/CPM.1. The structure complies with the PDCA cycle (Plan, Do, Check, Act), which is an adopted model for how systematic quality and environmental management activity is to be undertaken according to international standards to ensure that quality is maintained and developed.

Budget line is maintained for the external quality assurance of the reports prepared within the framework of the National System.

9. Hungary's National Registry

9.1. Registry administrator

<i>name</i>	Ákos Dénes
<i>email:</i>	denesa@mail.kvvm.hu
<i>tel:</i>	+36-1-224-92-49
<i>name</i>	Árpád Szerdahelyi
<i>email:</i>	szerdahelyi@mail.kvvm.hu
<i>tel:</i>	+36-1-224-91-96
<i>organization</i>	National Inspectorate for Environment, Nature and Water
<i>address</i>	Mészáros utca 58/a
<i>city</i>	Budapest
<i>post code</i>	1016
<i>country</i>	Hungary
<i>mailing address</i>	1539 Budapest, Pf. 675
<i>tel</i>	+36-1-224-91-00
<i>fax</i>	+36-1-224-92-74

9.2. Technical description

The technical description of the National Registry of Hungary is assembled in accordance with the reporting requirements laid down in Decision 22/CP.7

The Hungarian National Registry is a standalone registry, it is not operated together in a consolidated form with the registries of other nations. The National Inspectorate for Environment, Nature and Water acts as the registry administrator. The software which serves as the basis for the national registry is licensed from DEFRA (Department of Environment, Food and Rural Affairs, United Kingdom).

The software uses the Microsoft SQL Server 2000 relational database system with a dedicated data model for supporting registry operations. The servers running the registry application and

the database are maintained by the IT department of the Ministry for Environment and Water. The absolute maximum size of the SQL Server 2000 database is 1,048,516 Terabytes or 50 Terabytes per single file entry. SQL Server database model is also scalable up to 32 processors with 64 Gigabytes of memory. According to the calculated estimation of the annual growth of the database, the server capacity is well over the requirement.

The registry system has been developed for the EU Emissions Trading Scheme based on Regulation 2216/2004/EC. This scheme requires its Member States' registries to be compliant with the United Nations Data Exchange Standards (UN DES) specified for the Kyoto Protocol. Currently, the development adheres to the standards specified in Draft #7 of the UN DES document. The Hungarian registry was tested successfully by the European Commission in January 2006 and it is live operation from April 2006.

As part of the EU Registry development, the registry has developed functionalities for issuance, conversion, external transfer, (voluntary) cancellation, retirement and reconciliation processes using XML messages and web services as specified in Draft #7 of the UN DES document.

The Hungarian National Registry fulfils all required processes to minimise discrepancies in issuance, transactions, cancellation and retirement of ERUs, CERs, AAUs or RMUs. Each transaction is carried out according to the UN DES to minimise the risk of inconsistent data in the Hungarian National Registry and the independent transaction log (ITL) and EU supplementary transaction log (CITL). The transaction is not finalised until the transaction is registered on both registry servers. The transaction is cancelled if the ITL or CITL sends an error code. The Registry Administrator has to contact the Central Administrator at the ITL or the CITL for instructions if the registry fails to terminate the transaction. Manual corrections in the registry may be performed by the Registry Administrator commissioned by the Central Administrator.

According to the European Commission's above mentioned registry regulation, username and passwords are the only required level for secure log-in. Currently the built-in security module of the registry software is used, which conforms to the above rules. The implementation of additional security is planned in the future.

Database manipulations are only carried out by protected, internal stored procedures, which are not accessible directly from the user interface and can only be invoked by the internal web services of the registry software.

The Hungarian National Registry can be accessed through the following web address:

www.hunetr.hu

The IT department of the Ministry for Environment and Water (hosting agency) utilises the built-in backup module of the Microsoft SQL 2000 Server. The backup hardware is a 40 GB

DAT device. The data backup includes the transaction data stored in the database of the ETR and the system logs. Data backup is carried out daily and the backup of Monday of every second week is being kept for 5 years.

The hardware architecture of the system – two application servers and a database cluster – provides continuous availability and fast recovery in the event of a disaster.

Currently, the registry system for the EU Emissions Trading Scheme uses the security mechanism as specified within the EU Regulation – (Annex XV) – that uses basic authentication and SSL. For Kyoto, digital certification and VPN will be used when the ITL becomes available.