COMPLIANCE COMMITTEE

CC/ERT/IRR/2007/4
30 August 2007

Report of the review of the initial report of Hungary

Note by the secretariat

The report of the review of the initial report of Hungary was published on 29 August 2007. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2), the report is considered received by the secretariat on the same date. This report, FCCC/IRR/2007/HUN, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the review of the initial report of Hungary

According to decision 13/CMP.1, each Annex I Party with a commitment inscribed in Annex B to the Kyoto Protocol shall submit to the secretariat, prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later, a report (the 'initial report') to facilitate the calculation of the Party's assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, and to demonstrate its capacity to account for emissions and the assigned amount. This report reflects the results of the review of the initial report of Hungary conducted by an expert review team in accordance with Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Hungary, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 5 to 10 March 2007 in Budapest, Hungary, and was conducted by the following team of nominated experts from the roster of experts: generalist – Ms. Katarina Mareckova (Slovakia, European Community); energy – Ms. Kristin Rypdal (Norway); industrial processes – Mr. William Agyemang-Bonsu (Ghana); agriculture – Mr. Michael McGettigan (Ireland); land use, land-use change and forestry (LULUCF) – Mr. Hector Ginzo (Argentina); waste – Ms. Sirintornthep Towprayoon (Thailand). Ms. Katarina Mareckova and Ms. Sirintornthep Towprayoon were the lead reviewers. In addition the expert review team (ERT) reviewed the national system, the national registry, and the calculations of Hungary's assigned amount and commitment period reserve, and took note of the LULUCF parameters and the elected Article 3, paragraph 4 activities. The review was coordinated by Ms. Ruta Bubniene and Mr. Javier Hanna (UNFCCC secretariat).

2. In accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the Government of Hungary, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

1. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial reports prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report of Hungary was submitted on 30 August 2006, which is in compliance with decision 13/CMP.1, and was resubmitted on 27 September 2006. With the initial report, on 4 September 2006, Hungary submitted a greenhouse gas (GHG) inventory that had been revised since its 2006 GHG inventory submission of 19 April 2006. In its initial report Hungary refers to its 2006 GHG inventory resubmission of 4 September 2006 and to its national inventory report (NIR) submitted on 3 May 2006.

2. Completeness

4. Table 1 below provides information on the mandatory elements have been included in the initial report and reflects any revised calculations provided by Hungary resulting from the review process. These revised calculations are based on revisions of the estimates of emissions of nitrous oxide (N_2O) for liquid, solid and gaseous fuels from a number of stationary combustion sources (see paragraphs 63, 64 and 68), N_2O from road transportation for gasoline and diesel oil (see paragraph 67), N_2O from direct soil emissions (see paragraphs 80, 81 and 82), methane (CH_4) from solid waste disposal on land (see paragraph 94), CH_4 from waste-water handling (see paragraph 99) and N_2O emissions from human sewage (see paragraph 101). They resulted in revisions of the estimates of base year emissions from 123,034,090 tonnes carbon dioxide (CO_2) equivalent as reported originally by the Party to 115,397,149 tonnes CO_2 equivalent (see paragraphs 107 and 108) and revisions of the estimates of the 2004 inventory from 83,952,541 tonnes CO_2 equivalent as reported originally to 78,997.497 tonnes CO_2 equivalent (see paragraphs 110 and 111).

Table 1. Summary of the reporting on mandatory elements in the initial report

Item	Provided	Value/year/comment
Complete GHG inventory from the base year (average of years 1985, 1986 and 1987) to the most recent year available (2004)	Yes	Base year: average of years 1985, 1986, 1987
Base year for HFCs, PFCs and SF_6	Yes	1995
Agreement under Article 4	No	Not applicable
LULUCF parameters	Yes	Minimum tree crown cover: 30% Minimum land area: 0.5 ha Minimum tree height: 5 m Single minimum width of forest area: 10 m*
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	Forest management Annual accounting
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	578 260 222 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised estimate		542 366 600 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	419 762 705 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised estimate		394 987 486 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	The information provided in the initial report is general in nature and not complete. During the in-country review Hungary provided additional information.
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	The formal nomination of the administrator of the national registry will be confirmed with the adoption of a national legal instrument.

* Included by the Party in its initial report.

5. The information in the initial report generally covers the elements required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties and the Conference of the Parties serving as the Meeting of the Parties (CMP). Additional information on all elements was provided to the ERT during the in-country review. The ERT noted that the presentation of some of the mandatory elements of the national system (legal and procedural arrangements, archiving system, and quality assurance and quality control (QA/QC) plan) is not entirely in line with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1) and requested Hungary to provide additional information as a corrigendum to its initial report. The ERT appreciated that Hungary provided the documentation requested within six weeks after the in-country review in accordance with decision 22/CMP.1.

6. Hungary has provided its GHG inventory data for the base year (the average of the three years 1985–1987) and the years 1985–2004, and included most of the tables required with data on all relevant gases, sectors and categories. The inventory is complete in terms of geographic coverage.

7. Emission trends by gas and recalculations presented in the initial report included CH_4 and N_2O emissions from LULUCF (emissions not included in Annex A of the Kyoto Protocol). Emission trends by sector were not included in the initial report. Hungary provided updated trend tables to the ERT during the in-country review.

3. Transparency

8. The ERT noted that the information reported in the initial report is generally transparent. However, it contains some inconsistencies as between the common reporting format (CRF) tables and the NIR. The section related to the national system (institutional and procedural arrangements, data

collection, reporting and archiving) does not reflect sector-specific arrangements, and the information on the QA/QC plan does not reflect the situation currently achieved in Hungary. Specific aspects of transparency related to the NIR and the CRF tables are described in the relevant paragraphs of this report.

4. Emission profile in the base year, trends and emission reduction target

9. In the base year (averaged value for the three years 1985–1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the most important GHG in Hungary was CO_2, contributing 74.3 per cent to total[1] national GHG emissions expressed in CO_2 equivalent,[2] followed by N_2O (16.7 per cent) and CH_4 (8.8 per cent) (see figure 1). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 0.2 per cent of the overall GHG emissions in the base year. The energy sector accounted for 72.8 per cent of total GHG emissions in the base year, followed by agriculture (15.2 per cent), industrial processes (9.0 per cent), waste (2.7 per cent) and solvent and other product use (0.3 per cent) (see figure 2). Total GHG emissions (excluding LULUCF) amounted to 115,397.15 Gg CO_2 equivalent and decreased by 31.5 per cent from the base year to 2004. The emission trends by sector and by gas are comparable with those of other countries with economies in transition.

[1] In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO_2 equivalent excluding LULUCF, unless otherwise specified.

[2] In this report, the values for total and sectoral emissions in the base year and in 2004 reflect the revised estimates submitted by Hungary in the course of the review. These estimates differ from Hungary's GHG inventory submitted in 2006.

Figure 1. Shares of gases in total GHG emissions, base year

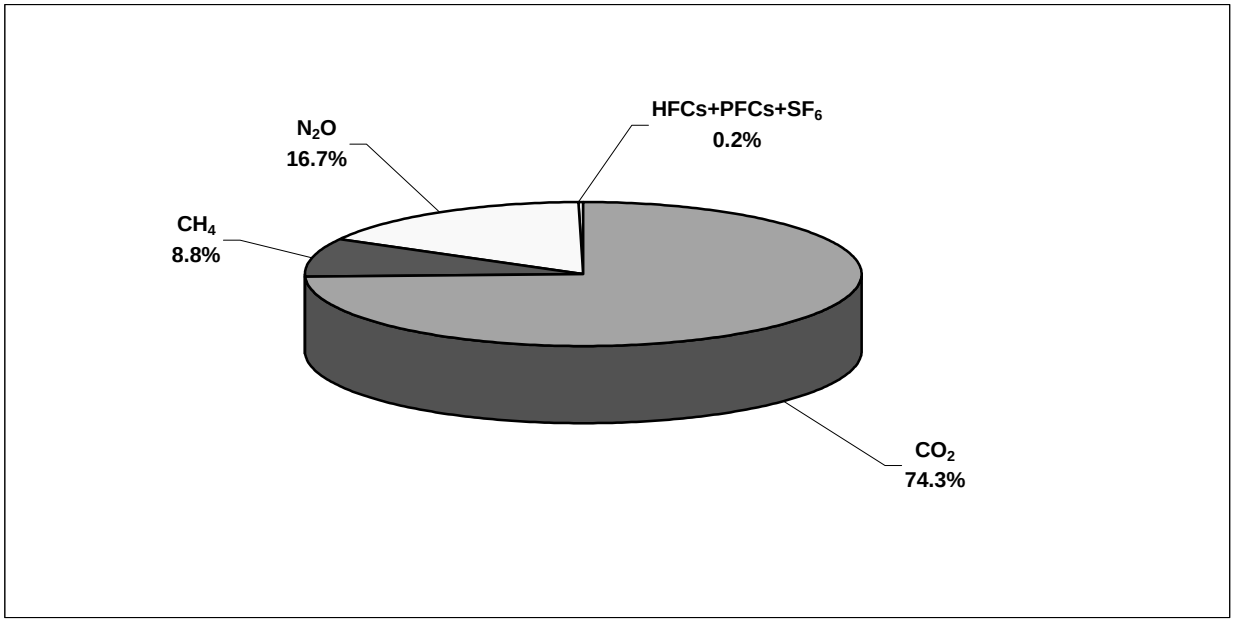
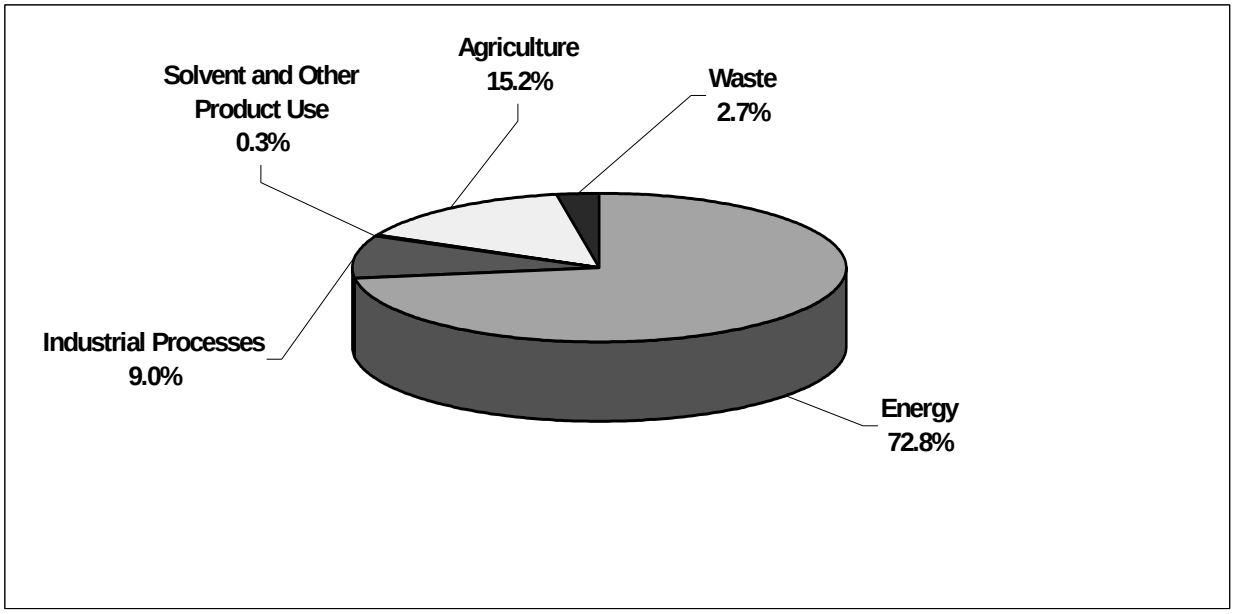


Figure 2. Shares of sectors in total GHG emissions, base year



10. Tables 2 and 3 show the greenhouse gas emissions by gas and by sector, respectively.

11. Hungary's quantified emission limitation is 94 per cent as included in Annex B to the Kyoto Protocol.

Table 2. Greenhouse gas emissions by gas, 1990–2004

GHG emissions (without LULUCF)	Gg CO_2 equivalent								Change
	Base year Kyoto Protocol[a]	1990	1995	2000	2001	2002	2003	2004[a]	KP BY–2004 (%)
CO_2	85 795.50	72 934.15	61 655.14	58 735.07	60 260.37	58 623.03	61 686.35	60 089.03	–30.0
CH_4	10 139.21	11 922.49	10 030.44	10 074.09	10 330.82	9 734.16	9 493.75	7 836.35	–22.7
N_2O	19 223.72	18 926.73	12 435.38	12 508.79	13 367.97	12 472.51	12 303.97	10 167.29	–47.1
HFCs	1.74	NA, NE, NO	1.74	205.73	280.73	403.54	498.71	525.55	30 024.1
PFCs	166.82	270.83	166.82	211.26	199.10	203.26	189.60	201.10	20.5
SF_6	70.15	39.87	70.15	140.11	107.43	119.55	161.92	178.17	154.0

Note: BY = Base year; KP = Kyoto Protocol; LULUCF = Land use, land-use change and forestry.

[a] Hungary submitted revised estimates for the base year and 2004 in the course of the initial review on 20 April 2007. These estimates differ from Hungary's GHG inventory submitted in 2006.

Table 3. Greenhouse gas emissions by sector, 1990–2004

Sectors	Gg CO_2 equivalent								Change
	Base year Kyoto Protocol[a]	1990	1995	2000	2001	2002	2003	2004[a]	KP BY–2004 (%)
Energy	84 006.31	73 822.18	64 051.45	60 576.59	62 258.80	60 776.75	63 999.43	60 082.99	–28.5
Industrial processes	10 440.31	8 462.83	4 779.33	5 665.18	5 868.29	5 034.13	5 211.13	5 769.24	–44.7
Solvent and other product use	384.46	311.73	250.38	235.84	263.38	208.31	274.58	336.64	–12.4
Agriculture	17 495.73	16 447.25	10 444.98	10 315.76	10 759.52	10 684.07	10 130.42	9 054.97	–48.2
LULUCF	NA	–3 820.64	–8 047.93	–3 219.15	–4 453.11	–4 554.93	–4 838.41	–5 518.28	NA
Waste	3 070.34	5 050.06	4 833.53	5 081.66	5 396.43	4 852.81	4 718.74	3 753.66	22.3
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	100 273.42	76 311.74	78 655.88	80 093.32	77 001.12	79 495.88	73 479.22	NA
Total (without LULUCF)	115 397.15	104 094.06	84 359.67	81 875.04	84 546.42	81 556.06	84 334.29	78 997.50	–31.5

Note: BY = Base year; KP = Kyoto Protocol; LULUCF = Land use, land-use change and forestry; NA = Not applicable.

[a] Hungary submitted revised estimates for the base year and 2004 in the course of the initial review on 20 April 2007. These estimates differ from Hungary's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

A. National system for the estimation of anthropogenic GHG emissions by sources and sinks

12. Hungary's national system is generally prepared in accordance with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol (decision 19/CMP.1).

13. Table 4 shows which of the specific functions of the national system are included and described in the initial report.

Table 4. Summary of reporting on the specific functions of the national system

Reporting element	Provided	Comments
Inventory planning		
Designated single national entity*	Yes	See section II.A.1
Defined/allocated specific responsibilities for inventory development process*	Yes	See section II.A.1
Established process for approving the inventory*	Yes	See section II.A.1
Quality assurance/quality control plan*	Yes	See section II.A.2
Ways to improve inventory quality	Yes	See section II.B.3
Inventory preparation		
Key category analysis*	Yes	See sectionII.B.1
Estimates prepared in line with IPCC guidelines and IPCC good practice guidance*	Yes	See section II.B.2
Sufficient activity data and emission factors collected to support methodology*	Yes	See section II.B
Quantitative uncertainty analysis*	Yes	See section II.B.2
Recalculations*	Yes	See section II.B.2
General QC (tier 1) procedures implemented*	Yes	See section II.A.2
Source/sink category-specific QC (tier 2) procedures implemented	No	See section II.A.2
Basic review by experts not involved in inventory	Yes	See section II.A.2
Extensive review for key categories	No	See section II.A.2
Periodic internal review of inventory preparation	Yes	See section II.A.2
Inventory management		
Archive inventory information*	Yes	See section II.A.3
Archive at single location	Yes	See section II.A.3
Provide ERT with access to archived information*	Yes	See section II.A.3
Respond to requests for clarifying inventory information during review process*	Yes	See section II.A.1

* Mandatory elements of the national system.

1. Institutional, legal and procedural arrangements

14. The information provided in the initial report was not sufficient to enable the ERT to fully assess whether the national system has been prepared in accordance with the guidelines, and it does not fully reflect the current and ongoing development of legal and procedural arrangements for establishing the national system in Hungary. During the in-country review additional documentation and information were provided to the ERT showing that the necessary action is under way to formalize the system. The national system is in place and the arrangements necessary to perform the mandatory functions of the national system have advanced significantly compared to the time when the initial report was prepared. The supporting legal framework (Act LX of 2007 on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol, governmental decrees and operational decrees) was under discussion at the time of the in-country review. Act LX was adopted by the Hungarian Parliament on 29 May 2007 and came into force at the end of June 2007. The ERT

concluded that Hungary is in a position to establish all the legal and procedural arrangements in line with Article 5, paragraph 1 of the Kyoto Protocol in 2007.

15. Bearing in mind the deadlines established by Article 5.1 of the Kyoto Protocol, the ERT recommended that Hungary strive to keep the May 2007 deadline set by the Party to adopt all the necessary legal instruments. The ERT requested Hungary to prepare an updated summary of the information on legal and procedural arrangements foreseen under the Kyoto Act and the related decrees in the form of a corrigendum to the initial report. The ERT appreciated Hungary's providing the documentation requested (an updated summary on the legal and procedural arrangements) within six weeks after the in-country review in accordance with decision 22/CMP.1.

16. In Hungary there is an established process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised by the inventory review. The Ministry for Environment and Water (MEW) has overall responsibility for the Hungarian GHG inventory and the national system and is the designated single national entity. It is responsible for the institutional, legal and procedural arrangements for the national system and for the strategic development of the GHG inventory. The Climate Change and Energy Department of the MEW supervises all national activities related to GHG inventories and the national system, and up to 2007 it approved the inventory before its submission to the secretariat. The Budget Bill specifies the financial provisions for the national system.

17. Based on a mandate of the MEW, a Greenhouse Gas Inventory Division (GHG Division) has been established in the Hungarian Meteorological Service (OMSZ)[3] for the regular preparation and development of the inventory (including development of the QA/QC plan and the electronic archiving system). The GHG Division[4] forms the inventory core team. It compiles the inventories and related reports and supervises the work of external experts and institutions, which are involved on a contractual basis. The responsibilities within the team and the nominations of the QA/QC manager and archive manager are laid down in the QA/QC plan and other official documents of the OMSZ. The head of the GHG Division coordinates the work of the team and organizes the cooperation with other institutions involved in inventory preparation. He is also responsible for the compilation of the CRF tables and the NIR. External experts supervised by coordinators in the GHG Division are responsible for the selection of methods, activity data (AD) and emission factors (EFs) in accordance with the principles and procedures set out in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). The GHG Division is also responsible for providing responses to requests for clarification of the inventory information resulting from the different stages of the review process, and information on the national system.

18. The national system currently operates on the basis of the internal rules on the national system laid down by the MEW, but these will be superseded by the regulations set up by Act LX on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol and its executive orders. A steering committee of prominent sectoral experts and government representatives is planned to be set up in 2007. This steering committee is dedicated to promoting dialogue in order to improve data quality and the methodology applied in the national system, and will consider and approve the national inventory prior to submission to the UNFCCC.

19. Under the Hungarian national system the major institutions and roles in terms of data provision for the national inventory are the following:

[3] The Hungarian Meteorological Service is an institution of the central government under the supervision of the Ministry of Environment and Water. Its duties are specified in a government decree from 2005.

[4] It must be noted, however, that the 2006–2007 inventory cycle is a period of transition with shared responsibility for inventory preparation of the former (MEW) and the new (OMSZ) teams.

(a) The Hungarian Central Statistical Office provides the basic data for estimating the emissions of each sector;

(b) The Ministry for Environment and Water provides data from the HIR (the waste management information system) for the waste sector;

(c) The Division for Emission Trading and the National Inspectorate for Environment, Nature and Water provide relevant data from certified reports of different plants for the energy and industrial processes sectors;

(d) Industrial associations provide data for estimating the emissions of the industrial processes sector;

(e) The Hungarian Energy Office compiles energy statistics and provides data for the energy sector;

(f) The Nature Conservation Office, the Ministry for Environment and Water, the State Forest Service and the Ministry of Agriculture and Rural Development support data collection and the compilation of the forest inventory for the LULUCF sector.

20. Hungary has a good basis for extending and improving its current system for the identification of forested parcels of land with a view to implementing a system for the estimation of forest management activities under Article 3, paragraph 4 of the Kyoto Protocol. However, the development of a reliable system for identifying land-use changes, including deforestation, is pending. The ERT encourages Hungary to enhance and further develop these efforts under the national system to cover activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

21. The ERT was satisfied with the responses to all the requests it made during the review and with the information provided after the in-country review. Hungary is reframing its national system and the new structure corresponds to the requirements of Article 5.1 of the Kyoto Protocol. The ERT assumes that the new national system can guarantee the timely compilation of GHG inventories in the near future when Hungary has set up all the necessary legal instruments as set out in the Act LX of 2007 on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol. The core inventory team at the OMSZ has the potential to further improve Hungary's GHG inventory. The ERT recommends Hungary to continue this process of further improvements.

2. Quality assurance/quality control

22. Hungary has elaborated a QA/QC plan in accordance with the IPCC good practice guidance. This includes general QC activities (tier 1).

23. Some QC procedures were implemented while the estimates were being calculated by the inventory experts. However, the ERT identified a number of areas where QA/QC procedures were apparently not implemented and this has resulted in mistakes, inconsistencies and non-transparent use of methods and EFs in some sectors.

24. The QA/QC plan[5] was presented to the ERT during the in-country visit. According to this document the OMSZ has nominated a quality manager who is responsible for coordination of the QA/QC activities. Responsibilities for particular sectoral checks are delegated to sectoral coordinators (staff of the GHG Division). External experts/contractors are responsible for QC of the consistency and completeness of the AD and the emission estimates. The QA/QC plan also includes deadlines for the completion of quality controls, a checking table (document ME 04-16/B01) with detailed records of checking activities, documentation files, records of changes and recalculations, and procedures for the annual updating of the QA/QC plan.

[5] QA/QC TERV 2007.03.01 –tol-2007.08.15-ig (in Hungarian).

25. At the time of the review, an external audit of the inventory compilation process at the GHG Division of the OMSZ was planned for the end of March 2007, and the GHG Division was in the process of accreditation under International Organization for Standardization (ISO) standard 9001. The ERT acknowledged the improvements that Hungary has achieved in its QA/QC activities and noted that a framework for a QA/QC system is in place. However, it considered that the QA/QC plan provided to it was rather general and would not ensure adequate quality of the national GHG inventory estimates; in particular, further improvements are needed to the quality of the data supplied by data providers. For instance, only a few data providers can provide factual evidence to prove the reliability of the data they collect. The ERT recommends Hungary to take urgent action to reduce these sources of uncertainty in its next submission.

26. The ERT recommended that Hungary further elaborate the existing QA/QC plan in line with the requirements of the IPCC good practice guidance, in particular regarding the routines for internal/external sectoral cross-checking of all documents related to submissions, such as the CRF tables, reports, background sources and documentation. In addition, the ERT recommended that Hungary develop and document extensive checking procedures (tier 2) for identified key categories and guidance for prioritizing inventory improvements. The procedure for official approval of recalculations should be incorporated into the QA/QC plan.

27. The ERT recommends that Hungary document the QA/QC procedures for activities related to Article 3, paragraphs 3 and 4, activities in a similar way.

28. The ERT requested that Hungary present summary information on the QA/QC plan elaborated as outlined above in the form of a corrigendum to the initial report, and after the in-country review Hungary provided the ERT with the information it requested. According to this information the GHG Division passed the ISO 9001:2000 audit in March 2007, after the in-country review. The updated QA/QC plan was provided, but in Hungarian. The ERT recommends Hungary to provide detailed information in English in its next inventory submission.

3. Inventory management

29. Hungary has an archiving system. During the review visit the ERT was provided with the additional archived information it requested. It noted that an electronic centralized archiving system was established in October 2006 at the OMSZ and currently contains all inventory information starting with the 2007 inventory submission and some information related to the 2006 submission. Historical data are archived by the organizations contracted to perform sectoral calculations and at the MEW. Currently the archive contains either electronic files or hard copies. Hungary plans gradually to move all relevant data to the centralized archiving system established at the OMSZ. This newly developed archiving system contains information on methods used, AD and EFs, calculations, background information, QA/QC information, documentation on annual key categories and key category identification, XML files and databases for the submission of inventory information, reports, literature, related legislation, contracts and guidelines. Technical maintenance and a twice-weekly backup of the system are performed by the information technology department of the OMSZ, which is accredited by ISO 9001. The system seems to be fully adequate for the future maintenance and archiving of inventory documentation. However, the current management of the system does not guarantee the full protection of the information stored.

30. The ERT recommended that Hungary nominate one of the inventory experts in the GHG Division of the OMSZ as archive manager with exclusive access and administrative rights to make changes in the archive. The ERT also recommended that Hungary prepare a procedural manual for the management and maintenance of the archiving system, including information on its structure, the content of different sections, responsibilities, access rights and other relevant information.

31. The ERT was satisfied with the additional information provided after the review on the structure and operation of the current inventory management set-up, and acknowledged the efforts being made by Hungary to make it fully compliant with the provisions of decision 19/CMP.1. It recommends that

Hungary continue to transfer all the relevant inventory information into the centralized archiving system at the OMSZ giving priority to the base year and the most recent year. It also recommends Hungary to make every effort to expedite the completion of its archiving system, to provide updated information in its next inventory report under the Kyoto Protocol, and to ensure that it archives the supplementary information related to Article 3, paragraphs 3 and 4, in a similar way.

B. Greenhouse gas inventory

32. In conjunction with its initial report, Hungary has submitted a complete set of CRF tables for the years 1985–2004 and for the base year (averaged value for the three years 1985, 1986 and 1987) and an NIR. Where needed the ERT also used the 2005 inventory submission, including the CRF tables for the years 1985–2004 and the base year.

33. During the review Hungary provided the ERT with additional information sources. These documents are not part of the initial report submission. The full list of materials used during the review is provided in annex I to this report.

34. After the in-country review, following the recommendations of the ERT, Hungary submitted revised CRF tables for the years 1990 and 2004.

1. Key categories

35. Hungary has reported a key category tier 1 and tier 2 analysis, both level and trend assessment, as part of its initial report submission. The NIR gives a transparent description of how the key category analysis was determined. Hungary has not, however, included the LULUCF sector in its key category analysis and does not report a key category analysis for the base year. The ERT recommends Hungary to include the LULUCF sector in the key category analysis and to report the key category analysis for the base year in its next inventory submission. During the in-country review, key category analyses including LULUCF for both the base year and 2004 were provided to the ERT.

36. The key category analyses performed by Hungary and the secretariat[6] produced similar results. There are a few differences in the results of these analyses, which can be explained by different levels of aggregation of N_2O emissions from stationary combustion. Hungary has merged N_2O emissions of different types of fuel into one category, while the secretariat disaggregates this category into three subcategories according the type of fuel.

37. Priority areas for inventory improvement have largely been determined on the basis of the key category analysis, by looking at the categories that are the largest contributors to the national inventory. There are a number of categories identified by Hungary and the ERT that warrant the use of higher-tier methods for which Hungary is currently using tier 1 methods. Limitations on the availability of AD and national/source-specific EFs continue to prevent the development of higher-tier methods. Systematic key category analyses should be used to prioritize improvements to and the development of the inventory.

2. Cross-cutting topics

38. The inventory is generally in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF), and in general it has been

[6] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year or base year period as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

compiled in accordance with Article 7, paragraph 1 of the Kyoto Protocol and decision 15/CMP.1. However, the ERT identified some cases where the methods and EFs used are not fully in line with this guidance. These cases are identified in the respective sectoral sections of this report below. The ERT also acknowledges that a number of these problems were corrected during the review. The ERT recommends Hungary to reflect these improvements and changes in its next inventory submission.

Completeness

39. Hungary has provided its GHG inventory data for the base year (the average of the three years 1985–1987) and the years 1985–2004, and has included most of the tables required with data on all relevant gases, sectors and categories. The inventory is complete in terms of geographic coverage. The notation keys are used throughout the tables. Those categories that are reported as "not estimated" ("NE") or "included elsewhere" ("IE") are explained in CRF table 9. The CRF tables are generally complete, with a few exceptions which are described in the relevant sectoral chapters of the NIR.

Transparency

40. The ERT noted that the transparency and quality of the information reported in the CRF tables and the NIR have improved since the previous (2005) submission. However, it noticed some inconsistencies between the CRF tables and the NIR. Moreover, the description of methodologies in the NIR should be improved by giving more detailed information. The ERT also noted that sufficient rationale for the selection of methods and EFs in some categories in the energy and agriculture sectors is not provided. The ERT recommends that the EFs used and their trends should be clearly referenced and that additional information be provided to support the applicability of country-specific EFs and methods.

Consistency

41. The methods, EFs and AD used in the Hungarian GHG inventory are consistent over the entire time series.

Comparability

42. The Hungarian inventory is comparable with those of other Parties, as defined in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines), including agreed reporting formats. The allocations of the source/sink categories follow the split in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance with a few exceptions, where categories are reported as "IE".

Accuracy

43. Hungary's inventory is in general accurate, as defined in the UNFCCC reporting guidelines. During the in-country review the ERT identified a few categories where the methods or EFs used were not fully in accordance with the IPCC good practice guidance and might lead to overestimation of emissions in the base year or underestimation of emissions in the most recent year (e.g. N_2O emissions for a number of stationary combustion sources, N_2O emissions from gasoline for road transportation, N_2O from nitrogen-fixing crops and from crop residues, and CH_4 from waste-water handling). The ERT recommended Hungary to revise its estimates for these categories. After the in-country review, Hungary provided revised estimates for these categories for the base year and 2004 in accordance with the recommendations of the ERT. Further details are provided in the sectoral sections below.

Recalculations and time-series consistency

44. The national system can ensure that recalculations of previously submitted estimates of GHG emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance. Recalculations have been undertaken when methods or EFs are changed or refined, when

new source categories are included in the inventory or when mistakes in the estimates are identified and corrected. Recalculations were performed in Hungary's 2002, 2003, 2005 and 2006 submissions and are correctly reported in the CRF tables.

45. The ERT noted that recalculations reported by Hungary of the time series from the base year to 2004 have been undertaken in the energy, industrial processes, agriculture and waste sectors. However, the NIR does not provide sufficient information to explain these recalculations, and the information on recalculations provided in the NIR is not fully consistent with that provided in the CRF tables.

46. During the in-country review Hungarian experts explained to the ERT the rationale for the recalculations: (a) appropriate country-specific EFs have been used for lignite in the energy sector; (b) the AD for glass, tile and brick production in the industrial processes sector are more complete; and (c) mistakes in calculations were identified and corrected in the agriculture sector and the waste-water handling category. These explanations justify the recalculations, but the ERT recommends Hungary to include appropriate information and the rationale for recalculations in its future NIRs and to check the consistency of the information provided in the NIR and the CRF tables.

47. The effect of the recalculations on the estimates of total national emissions in the base year (as reported in the original 2006 submission) was an increase of 921.30 Gg CO_2 equivalent, or 0.8 per cent, while in 2003 the effect was an increase of 1,115.08 Gg CO_2 equivalent, or 1.3 per cent. The most significant change in the base year appeared in the industrial processes sector.

Uncertainties

48. Hungary has provided an uncertainty analysis for each source category and for the inventory in total, following the IPCC good practice guidance tier 1 method. The ERT noted that a number of input data, both for EFs and for AD, are based on expert judgement. Hungary has made efforts to use the results of the uncertainty assessment for prioritization of further improvements to the inventory, and the ERT encourages it to further improve the uncertainty analysis and to document the input data from experts used for the analysis in accordance with the IPCC good practice guidance, in its next submission.

49. According to the NIR, the estimates for CO_2 emissions from fuel combustion show the lowest uncertainties, while the estimates for N_2O emissions from fuel combustion show the highest uncertainties. The estimated combined uncertainty for 2004 in total emissions is 5.2 per cent and the uncertainty introduced in the trend is 2.4 per cent, while the uncertainties range between 2 and 4 per cent for CO_2 emission estimates, between 15 and 25 per cent for CH_4, and between 80 and 90 per cent for N_2O. The results of the uncertainty analysis have not changed compared to the previous submission.

3. Areas for further improvement identified by the Party

50. The NIR identifies several areas for improvement. In its response to the questions raised during the in-country review, Hungary indicated that it is working to improve its estimates in different categories (see details in the sectoral sections of this report below). Hungary also indicated that all the relevant inventory data will be gradually included in the centralized archiving system and that it is working to improve its estimates in the LULUCF sector and fully satisfy the requirements of decision 13/CP.9.

51. Hungary is in the process of improving its national QA/QC plan, and it will be updated by August 2007. The GHG Division of the OMSZ passed the ISO 9001 accreditation in March 2007, as Hungary informed the ERT after the in-country review, and this will help in strengthening QA/QC activities.

52. Regarding sectoral improvements, the NIR identifies the following items. Hungary should:

(a) Improve the consistency and accuracy of the time-series data for the CH_4 and N_2O EFs in the energy sector;

(b) Further increase the accuracy of the EF on the basis of measurements and a longer data series for nitric acid production;

(c) Further refine its consumption data for consumption of halocarbons and SF_6, primarily as regards final use;

(d) Further enhance the accuracy of the information on the rearing and feeding conditions of livestock and use tier 2 methods for the most important categories (dairy cows and other cattle) under enteric fermentation;

(e) Calculate country-specific EFs and use tier 2 methods for the most important categories (dairy cows, other cattle, swine) under manure management;

(f) Further verify both the AD and the background inventory information for the forest land category;

(g) Obtain more precise data and detailed information on municipal solid waste disposal sites and waste-water treatment, and complete the AD on industrial waste incinerators.

4. Areas for further improvement identified by the ERT

53. The ERT identified the following cross-cutting issues for improvement. The ERT recommends that Hungary:

(a) Provide a more detailed description of the approaches taken and the underlying assumptions used for the uncertainty estimates in the NIR;

(b) Improve the transparency of its estimates by providing more precise descriptions and documentation of methodologies and EFs that differ from those of the IPCC. This should be done by the experts responsible for the estimates in the respective sectors. Hungary is also encouraged to check and better explain the fluctuations in implied emission factors (IEFs) in response to questions raised in previous review stages;

(c) Improve consistency by systematic cross-checking of the information provided in the NIR and that provided in the CRF tables;

(d) Further develop and then implement the QA/QC procedures for each sector, and in particular implement tier 2 QA/QC procedures for identified key categories;

(e) Elaborate a management plan for the established centralized archiving system;

(f) Elaborate a detailed inventory manual for inventory planning and management which reflects national circumstances and includes detailed descriptions of formal procedures, time schedules, data flow, documentation formats and guidance for improvements;

(g) Strengthen its institutional capacity by ensuring adequate long-term financial support for inventory-related contracts and arrangements and by encouraging inventory experts to attend the UNFCCC training courses as soon as possible;

(h) Collect AD and develop well-documented country-specific EFs for use with higher-tier methods for key categories.

54. Recommended improvements relating to specific source/sink categories are presented in the relevant sector sections of this report.

5. Energy

Sector overview

55. In the Kyoto Protocol base year (averaged value for the years 1985, 1986 and 1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6) the energy sector of Hungary accounted for 72.8 per cent of total national GHG emissions. Among the different categories, energy industries (1.A.1) was the most important (30.3 per cent of the total sectoral emissions), followed by other sectors (1.A.4) (29.7 per cent) and manufacturing industries and construction (1.A.2) (27.6 per cent). Total sectoral emissions decreased by 28.5 per cent between the base year and 2004. Emissions in the transport category (1.A.3) increased by 36.5 per cent between the base year and 2004.

56. All the main IPCC categories and gases are covered for the energy sector. The sectoral background data tables are essentially complete for the base year. However, some categories, most importantly petroleum refining (1.A.1b), manufacture of solid fuels and other energy industries (1.A.1c), and distribution of natural gas (1.B.2b.iv), are reported as "IE". As a follow-up to the review, the ERT was informed that emissions from distribution of natural gas (1.B.2.b.iv) were reported separately in the CRF tables of the inventory submission prepared after the 2006 submission. Hungary is encouraged to try to find practical ways of increasing the transparency of its reporting for these categories.

57. The reporting of the energy sector is generally transparent. However, the methods used, the origin of EFs and conversion factors, how they relate to Hungarian technologies, and sector-specific QA/QC procedures are not adequately described in the NIR. Hungarian experts supplied the ERT with additional explanations and data during and after the initial review and these increased the transparency of the base year emission estimates. The ERT recommends Hungary to improve the NIR with respect to the descriptions of methods used, the origin of the EFs and conversion factors used, how they relate to Hungarian technologies, and sector-specific QA/QC procedures.

58. Hungary is encouraged to better explain in its NIR how the EFs used in the inventory estimation that were obtained from the European Union (EU) emissions trading scheme (ETS) were determined and which QA/QC and verification procedures were followed for these data (EFs and energy data). The ERT also recommends Hungary to compare and document the differences between the data on energy consumption used in the inventory and those used for the ETS.

Reference and sectoral approaches

59. CO_2 emissions from fuel combustion have been calculated using both the reference and the sectoral approaches. Hungarian experts provided a revised estimate of the reference approach for the base year during the in-country review. For the base year there is a difference of +0.5 per cent in the CO_2 emission estimates as between the two approaches. The difference in fuel consumption is 0.6 per cent. The differences in individual fuels are generally small and were explained by Hungary during the in-country visit. The reduction in CO_2 emissions from the base year to 2004 is –29.4 per cent using the reference approach (–28.5 per cent using the sectoral approach). The ERT encourages Hungary to better document the calculations of CO_2 emissions using the reference approach (including assumptions about energy stored) in its next NIR and to explain any differences. Hungary is also encouraged to explain the differences between the International Energy Agency (IEA) energy statistics and those reported in the CRF tables.

International bunker fuels

60. Emissions from aviation bunkers are reported separately from domestic use and are not included in total national emissions. Hungary explains in the NIR that international river transport is insignificant, and it has not reported any marine bunkers.

Feedstocks and non-energy use of fuels

61. AD for non-energy use of fuels are included in the energy sector (fuel combustion (1.A). However, emissions from this category are reported under the industrial processes sector. Hungary is encouraged, in line with the Revised 1996 IPCC Guidelines and to improve transparency, to reallocate the AD for feedstocks and non-energy use of fuels and resulting emissions to the industrial processes sector. There is no indication of double counting of emissions between the energy and industrial processes sectors.

Country-specific issues

62. Hungary reports 20 Gg of CH_4 emissions in the base year from wells drilled at the Great Plain subsurface waters under other – stationary (1.A.5a). This is currently an estimate based on expert judgement. The ERT was informed that Hungary is planning to improve these estimates in the future by collecting and analysing data from the wells. The ERT recommends Hungary to reallocate these emissions to the oil and natural gas category (1.B.2) and to report in detail the results of the field work and the methods used to estimate these emissions in its next inventory submission. As a follow-up to the review the ERT was informed that emissions from this category were reported separately in the CRF tables of the inventory submission prepared after the 2006 submission.

Key categories

Stationary combustion: liquid, solid and gaseous fuels – N_2O

63. The N_2O IEFs reported for public electricity and heat production for the complete time series (for the base year 13.3 kg/TJ, 14.0 kg/TJ and 2.9 kg/TJ for liquid, solid and gaseous fuels, respectively) are among the highest of reporting Parties and are much higher than the IPCC default values (0.6 kg/TJ, 1.4 kg/TJ and 0.1 kg/TJ, respectively). During the in-country review Hungary explained that these values the were result of a literature review, but the ERT was not given information on the exact source for these EFs or on how these country-specific EFs reflect Hungarian combustion technologies. The ERT invited Hungary either to use the IPCC default EFs or to provide better documentation to support its choice of country-specific EFs. After the in-country visit, in response to the ERT's recommendations, Hungary submitted revised EFs for liquid and solid fuels for the base year and 2004. The revised EFs were derived from recognized international literature recently published. For natural gas Hungary provided sufficient documentation of the value used in the original submission and the ERT agreed that this value was appropriate.

Stationary combustion: gaseous fuels – N_2O

64. The N_2O IEFs reported for gaseous fuels from iron and steel (3.0 kg/TJ) and from other categories under manufacturing industries and construction for the complete time series are among the highest of reporting Parties and much higher than the IPCC default value (0.1 kg/TJ). During the review visit, Hungary explained that the EFs were the result of a literature review, but the ERT was not given information on the exact source for them or on how these country-specific EFs reflect Hungarian combustion technologies. Hungary is encouraged either to use IPCC default EFs or to provide better documentation to support its choice of country-specific EFs. After the in-country visit, Hungary provided sufficient documentation of the value used in the original submission and the ERT agreed that this value was appropriate.

Road transportation: gasoline and diesel oil – N_2O

65. Hungary reports a constant IEF of 15 kg/TJ for emissions from gasoline vehicles for the complete time series. This is the highest IEF of all reporting Parties for the base year. The ERT recommended Hungary to revise the EFs for all years of the time series taking into account that cars with catalytic converters probably did not exist in the years 1985–1987 and have only been gradually

introduced over time. Furthermore, Hungary should explore the possibilities of implementing higher-tier methods for road transportation and using bottom-up calculations to verify the CO_2 estimates derived using the national energy statistics.

66. Similarly, the IEF for diesel oil (6 kg/TJ) is the highest of reporting Parties and above the IPCC default range (3–4 kg/TJ) for the complete time series, and Hungary was invited to justify the use of this EF or to revise it.

67. After the in-country visit, in response to the ERT's comments, Hungary submitted revised EFs for gasoline and diesel oil in line with the recommendations of the ERT and provided documentation with the rationale for choosing the revised EFs for the base year and 2004 (2.44 kg/TJ and 3.90 kg/TJ, respectively).

Stationary combustion: liquid, solid and gaseous fuels – N_2O

68. The N_2O IEFs for some combinations of categories and fuels in other sectors – gaseous fuels in the residential category (24.00 kg/TJ), liquid fuels (from 30.87 kg/TJ to 30.06 kg/TJ) and gaseous fuels (30.00 kg/TJ) in the agriculture/forestry/fisheries category, and solid fuels in general (from 14.0 kg/TJ to 12.03 kg/TJ) – are among the highest of reporting Parties and much higher than the IPCC default values (1.4 kg/TJ, 0.6 kg/TJ and 0.1 kg/TJ for solid, liquid and gaseous fuels, respectively). The ERT invited Hungary either to use IPCC default EFs or to provide better documentation to support its choice of country-specific EFs. After the in-country visit, in response to the ERT's recommendations, Hungary submitted revised EFs for liquid, gaseous and solid fuels for the base year and 2004. The revised EFs were derived from recognized international literature recently published.

Oil and natural gas – CH_4

69. Hungary reports emissions from natural gas distribution together with natural gas transmission. However, the AD in the CRF tables only include distribution. Hungary assumes the presence of Western technologies in the country and uses EFs from the IPCC good practice guidance. Hungary is encouraged to collect country-specific EFs for natural gas transmission and distribution and to increase the transparency of its reporting. As a follow-up to the review the ERT was informed that emissions from this category were reported separately in the CRF tables of the inventory submission prepared after the 2006 submission.

6. Industrial processes and solvent and other product use

Sector overview

70. In the Kyoto Protocol base year (averaged value for the years 1985, 1986 and 1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), total GHG emissions from the industrial processes sector amounted to 10,440.31 Gg CO_2 equivalent, or 9.0 per cent of total national emissions. Chemical industry accounted for 62.7 per cent of emissions from the sector, followed by mineral products (28.9 per cent), metal production (7.7 per cent) and consumption of halocarbons and SF_6 (0.7 per cent). Total sectoral emissions decreased by 44.7 per cent between the base year and 2004.

Key categories

Cement production – CO_2

71. In its 2006 submission, Hungary has used the IPCC tier 3 methodology for the first time for estimating CO_2 emissions from this category. Using the carbonate content of the raw material, Hungary calculated the CO_2 emissions using stoichiometric ratios. Hungary indicates in the NIR that there is a quantity of magnesium carbonate ($MgCO_3$) in the raw material used for the clinker production but it has not estimated the associated emissions using the appropriate stoichiometric ratios, as was done for calcium carbonate ($CaCO_3$), even though the NIR indicates that this was done. The ERT recommends

that Hungary estimate the CO_2 emissions from $MgCO_3$ to ensure completeness in this category. As a follow-up to the review the ERT was informed that CO_2 emissions from $MgCO_3$ were included in the CRF tables of the inventory submission prepared after the 2006 submission.

Ammonia production – CO_2

72. In its 2006 submission, Hungary has estimated CO_2 emissions from ammonia production for the first time using the recommended IPCC methodology (i.e., based on natural gas consumption). It has, however, filled in the CRF tables with AD for ammonia production. During the in-country review the ERT went through the background calculation worksheets and realized that Hungary, correctly, has used the natural gas consumption data for estimating these CO_2 emissions. The ERT recommends that Hungary ensure that the CRF tables report the appropriate AD used by Hungary in its future submissions. As a follow-up to the review the ERT was informed that appropriate AD (natural gas consumption) were reported in the CRF tables of the inventory submission prepared after the 2006 submission.

Nitric acid production – N_2O, CO_2

73. Hungary uses plant-specific methodology and EFs for estimating these N_2O and CO_2 emissions. The N_2O EF used in the base year (0.0144 t/t) is high compared with those of other Parties (0.0013 t/t–0.0137 t/t). Hungary explained during the initial review visit that the nitric acid plants are very old, were established before 1975 and have GIAP technology (technology developed by the Russian State Research and Design Institute of Nitrogen and Organic Synthesis Products), so that according to the IPCC good practice guidance they are classified as older plants (pre-1975), and without non-selective catalytic reduction (NSCR). Hungary calculates the CO_2 emissions associated with the nitric acid production but does not include them in the total emissions from this category, even though they are small compared to the N_2O emissions. The ERT recommends Hungary to include these emissions in its next submission. The uncertainty associated with the EFs used by Hungary is high (30–40 per cent). The ERT encourages Hungary to continue its efforts to measure actual N_2O emissions in order to reduce the uncertainty associated with the EFs used. As a follow-up to the review the ERT was informed that CO_2 emissions from this category were reported in the CRF tables of the inventory submission prepared after the 2006 submission.

Non-key categories

Other (carbon black) – CH_4

74. Hungary produces activated carbon but does not include CH_4 emissions from this category in the national total. During the initial review visit Hungary explained that there is only one such plant in the country and the AD are therefore confidential; moreover, the plant will be decommissioned in the near future. For the sake of completeness, the ERT encourages Hungary to report the CH_4 emissions from this plant until it is decommissioned. After the in-country review Hungary calculated the CH_4 emissions from this plant and confirmed that they will be included in the national total.

7. Agriculture

Sector overview

75. In the Kyoto Protocol base year for Hungary (averaged value for the years 1985, 1986 and 1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the agriculture sector accounted for 15.2 per cent of total national emissions, with 75.9 per cent of emissions in this sector being N_2O. The agricultural soils category is the dominant category in the sector, contributing 62.1 per cent of sectoral emissions in the base year. Emissions from the sector decreased by approximately 50 per cent between 1989 and 1993 and remained stable thereafter. They were 48.2 per cent lower in 2004 than in the base year. N_2O from direct soil emissions, N_2O from indirect emissions, N_2O from manure management and

CH_4 from enteric fermentation are key categories in Hungary, accounting for 14.0 per cent of total national emissions in the base year.

76. Hungary has good statistical data on agriculture and has used them in a consistent way across the time series. There is heavy reliance on tier 1 methods and the default EFs provided by the Revised 1996 IPCC Guidelines rather than on the improved methodologies given in the IPCC good practice guidance, and this has led to a number of inventory problems in this sector which have implications for the level of total estimated emissions. The system of contracts on the basis of which the inventory is produced requires strengthening and clarification of participants' roles. In particular, as the primary means to improve transparency, the contracted inventory compiler should also prepare the NIR related to the agriculture sector.

Key categories

Enteric fermentation – CH_4

77. Hungary's regression equation for the calculation of the CH_4 EF for dairy cattle is based on the three values given in table 4.3 of the Revised 1996 IPCC Guidelines and their corresponding milk yields. While the EFs calculated by Hungary obviously lie within the range of the defaults, the Revised 1996 IPCC Guidelines give no basis for using discrete default values representing different regions of the world in the way Hungary has done. It is clear that the dairy cattle population has changed considerably in regard to both composition and animal numbers, and detailed information about the animals and particularly their feed is therefore needed to support the high EF for CH_4, which is based solely on average milk yield.

78. During the in-country visit, the ERT requested Hungary to report this information so that feed energy can be reconciled with animal type and their high levels of CH_4 production, and with the chosen value of 100 kg/year for nitrogen (N) excretion by dairy cattle. The results of a preliminary tier 2 EF analysis and the additional statements regarding the development of the dairy cattle herd which Hungary provided in response substantiated the relatively high EFs used. Moreover, the relationship with milk yield maintains time-series consistency. The information provided should be elaborated in Hungary's next NIR and the tier 2 results should be applied in its next inventory submission.

Manure management – N_2O

79. Hungary applies West European rates of N excretion for all livestock categories and retains the same distribution of excreted nitrogen per animal waste management system (AWMS) in all years. The justification for this is provided in section 6.3.3 of the NIR but further information should be provided to show how constant N excretion for dairy cattle is consistent with the major changes in population and milk yield that took place over the time series. Tier 1 default EFs have been used to estimate N_2O emissions. The management of animal wastes in solid storage, which is dominated by cattle manures, accounts for more than 95 per cent of N_2O emissions from manure management annually in Hungary.

Direct soil emissions – N_2O

80. Direct N_2O emissions from animal manure applied to soils have been calculated using the Revised 1996 IPCC Guidelines instead of the IPCC good practice guidance, which results in slight underestimation. Hungary accepted this finding by the ERT and agreed to revise the estimates in accordance with the improved methodology of the IPCC good practice guidance. Following the review Hungary submitted revised estimates which were fully in line with the IPCC good practice guidance for the base year and 2004.

81. The tier 1 method of the 1996 Revised IPCC Guidelines has been used to calculate the amount of nitrogen fixed by N-fixing crops (F_{BN}) for all N-fixing crops rather than the IPCC good practice guidance equations, resulting in overestimation of nitrogen inputs due to N-fixing forage crops. Hungary agreed to

revise its estimates for this category in line with the IPCC good practice guidance. Following the review Hungary submitted revised estimates in line with the ERT's recommendation for the base year and 2004 using the tier 1b method.

82. The ERT found that N_2O emissions from crop residues returned to soils are overestimated due to incorrect accounting for nitrogen inputs from N-fixing forage crops and the inclusion of grass and other fodders in the range of non-N-fixing crops that Hungary uses to quantify the total nitrogen input to soils from crop residues (F_{CR}). The ERT advised Hungary that the fodder crops would not produce residues for incorporation into soil. Hungary agreed to revise the estimate of F_{CR} according to the IPCC good practice guidance and following the review submitted revised estimates for the base year and 2004 in accordance with the ERT's recommendation and the IPCC good practice guidance.

8. Land use, land-use change and forestry

Sector overview

83. In the base year (averaged value for the years 1985, 1986 and 1987) the LULUCF sector in Hungary was a net sink; it offset 2.4 per cent of total national emissions. Hungary's reporting of the sector is not complete (e.g. changes in soil carbon are not estimated in the forest land remaining forest land category) and is not always transparent (e.g. land conversions to forest land are not disaggregated and all land conversions are reported under the subcategory other land converted to forest land). Some notation keys are used incorrectly in some of the CRF tables (e.g. in CRF table 5.C for cropland converted to grassland, AD are reported as "not occurring" ("NO"), but carbon stock change in living biomass is reported as "NE" instead of "NO"; and in CRF table 5.E for wetlands converted to settlements, AD are reported as "not applicable" ("NA"), but carbon stock change in living biomass is reported as "NE" instead of "NA"). The carbon stock changes in biomass for forest land were recalculated in the 2006 submission for the complete time series because a different IPCC estimation methodology (biomass stock change) was applied compared with the previous (2005) inventory submission.

84. The ERT recommends that the identification of land-use changes and the associated emissions/removals should be prioritized. Even if the modelled carbon dynamics in forest soils showed that forest soils are not carbon sources, a system for sampling and measuring carbon in soil should be put in place to validate any pertinent modelling of its dynamics.

85. The present system for identification of forested parcels of land in Hungary, if enlarged and improved, provides a good basis for implementing a system for the estimation of forest management activities under Article 3, paragraph 4 of the Kyoto Protocol. The development of a reliable system for identifying land-use changes, including deforestation, is pending. A sectoral QA/QC system should be established and implemented fairly quickly as part of the national system. The database of the Forest Research Institute should be integrated as soon as possible into the national system, together with databases for the non-forest activities in the sector.

Key categories

Forest land remaining forest land – CO_2

86. The secretariat identified forest land remaining forest land – CO_2 (5.A.1) as a key category in the base year. This category represented net CO_2 removals in the base year of 3,393.03 Gg. These removals were accounted solely by carbon stock changes in living biomass; they were estimated by measuring the change in biomass stocks as described in the IPCC good practice guidance for LULUCF, combining both country-specific data (tier 2) and IPCC default values (tier 1). Changes of carbon stocks in dead organic matter and in soils have not been estimated for the base year because of lack of data. This lack of data cannot currently be remedied, but as those carbon pools are integral parts of this key category Hungary should make efforts to develop appropriate higher-tier models for estimating those missing values.

Here, Hungary has expressed its intention to develop a model for estimating changes in the carbon content of forest soils. It could also develop a model for estimating the changes in carbon in dead organic matter as well. These models would make complete evaluation of CO_2 emissions in this category possible.

9. Waste

Sector overview

87. In the Kyoto Protocol base year (averaged value for the years 1985, 1986 and 1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the waste sector in Hungary accounted for 2.7 per cent of total national GHG emissions, with solid waste disposal on land contributing the largest portion to the sectoral emissions (62.4 per cent). Compared to the base year, in 2004 waste sector emissions had increased by 22.3 per cent. An increase in CH_4 emissions from solid waste disposal on land (by 47.6 per cent relative to the base year) accounted for most of this change.

88. The ERT noted that the inventory is not complete as N_2O emissions from human sewage from the base year to 2004 are reported as "NE". Previous review reports have mentioned this problem.

89. Recalculations have been done for the base year and the period 1991–2000, according to the NIR. The ERT noticed inconsistencies in the information provided in the NIR and in the CRF tables, and recommends Hungary to explain clearly and in detail the rationale for the recalculations in its future NIRs in order to increase transparency.

90. The ERT noted that no formal QA/QC system was in place for the waste sector during the in-country visit. QA/QC activities in compliance with ISO 9000 are only performed for waste incineration. Uncertainties have been estimated for all categories of the waste sector.

91. Hungary plans to improve the quality of the inventory using data from surveys started in 2001 with the application of the National Act on Waste and the National Waste Management Plan. In addition, more precise data will be obtained after new regulations adopting EU requirements enter into force in Hungary. Hungary also informed the ERT that the data on waste-water handling will be improved with the application of a national law introducing a new system for standardized reporting by entrepreneurs.

Key categories

Solid waste disposal on land – CH_4

92. Hungary has used a tier 1 country-specific methodology for estimating these CH_4 emissions in the base year and for the whole time series. Estimates of emissions using the tier 1 method of the Revised 1996 IPCC Guidelines are also reported in the NIR. The results for the two methods are very similar. Hungary has used data on waste collected supplied by the Hungarian Central Statistical Office. In the base year, data were provided in terms of volume of waste and had to be converted to mass values by applying waste density. In the base year no estimates of CH_4 from unmanaged waste disposal sites are reported. The ERT encourages Hungary to provide estimates for unmanaged waste disposal sites in its next submission. The ERT also noted that the value of degradable organic carbon (DOC) in the CRF tables is not reported in terms of organic composition, as it should be according to the recommendations of the Revised 1996 IPCC Guidelines, and this should be clearly explained in the NIR. The ERT recommends Hungary to improve the transparency of its reporting by providing more detailed explanations and information in its next NIR. After the in-country review, Hungary informed the ERT that it had corrected the DOC values in the CRF tables.

93. The two most recent review reports recommended Hungary to use tier 2 methods to estimate CH_4 emissions from solid waste disposal sites (SWDS). During the in-country review the ERT was informed that a landfill site database is being developed, based on geographic information system maps,

and encouraged Hungary to make the best possible use of the existing information which will support the use of higher-tier methods in its next submission. Also during the review visit the ERT confirmed that in the base year CH_4 recovery did not occur in the country.

94. After the in-country review Hungary revised its estimates of emissions from SWDS using a tier 2 method in line with the IPCC good practice guidance. The revision of the estimates led to a reduction in estimated CH_4 emissions from SWDS by 51.3 per cent in the base year and by 19.3 per cent in 2004 compared to the estimates in the original 2006 inventory submission.

95. The ERT welcomes Hungary's plan to further improve the quality of the inventory by using actual waste composition data supplied by the counties instead of those currently used, which refer only to Budapest.

Waste-water handling – CH_4

96. Hungary has used the default method of the Revised 1996 IPCC Guidelines to estimate CH_4 from domestic, commercial and industrial waste-water handling using population data and data reported by regional inspectorates.

97. As noted by in the previous (2005) review report, some inconsistencies were found between the NIR and the CRF tables, including incorrect use of the notation keys in CRF table 6.B.

98. For the base year, Hungary has used default value of 0.25 kg/kg degradable organic component (DC) as the EF and a methane conversion factor (MCF) of 1. The NIR reports that part of the municipal waste-water streams undergoes aerobic degradation without methane production. However, this part has not been taken into account in the estimation, and this may lead to emissions in the base year being overestimated. The ERT recommended Hungary to revise its estimates of CH_4 emissions from domestic, commercial and industrial waste water taking into account the existing country-specific data on fractions of waste water treated. In addition, the ERT recommended Hungary to use the maximum methane producing capacity (Bo) in terms of biochemical oxygen demand (BOD) instead of chemical oxygen demand (COD).

99. After the in-country review, Hungary revised its estimates of emissions from domestic and commercial waste-water handling in accordance with the ERT's recommendations and used the same improved principle for estimating industrial waste-water emissions. This revision led to a reduction in estimated CH_4 emissions by 39.5 per cent in the base year and by 43.3 per cent in 2004. For these revised estimates Hungary used MCF values of 0.5 for septic systems and 0.15 for treatment plants. The BOD value was changed from 50 to 60 g/person/day and the Bo from 0.25 to 0.6 kg CH_4/kg BOD to be in line with the IPCC good practice guidance.

100. As pointed out in previous reviews, some emissions from this category, in particular N_2O and CH_4 from sludge, are not estimated. The ERT recommends Hungary to include these emissions in its next inventory.

Non-key categories

Waste-water handling – N_2O

101. The ERT noted that N_2O emissions from human sewage are not estimated in Hungary's 2006 inventory submission; previous review reports have also pointed out this omission. After the in-country review, however, Hungary included estimates of N_2O emissions from human sewage for the whole time series in its revised CRF tables. This led to an increase of estimated N_2O emissions in the base year and 2004 by 0.67 Gg, or 3.8 per cent in emissions from the sector in the base year compared to the 2006 submission.

102. These emissions were decreasing in the early 1990s but showing an increasing trend from 1998 due to the changes in the per capita protein consumption, as reported by the Hungarian Agricultural Economics Research Institute and the Food and Agriculture Organization of the United Nations.

Waste incineration – N_2O

103. The emissions of N_2O reported are those from the municipal waste incineration plant located in Budapest. This plant is the only one with power co-generation in the country. The time series of N_2O emissions has been affected by several reconstructions of this plant in recent years. Emissions in the base year were lower in terms of CO_2 emissions and higher in terms of N_2O emissions than emissions in 2004 due to the several reconstructions of the plant indicated above. Hungary expects to incinerate 420,000 tonnes of waste per year from 2006 onwards.

104. Since 24 MW of electricity are produced from waste incineration in this plant, the ERT recommends Hungary to allocate emissions from this category in the energy sector. The ERT also encourages Hungary to use plant-specific values of N_2O emissions from the flue gas measurements of the incinerator in order to improve the quality of the inventory in its future submissions.

C. Calculation of the assigned amount

105. The assigned amount pursuant to Article 3, paragraphs 7 and 8, is calculated in accordance with the annex to decision 13/CMP.1.

106. Hungary's base year is the averaged value for the years 1985, 1986 and 1987 and Hungary has chosen 1995 as its base year for HFCs, PFCs and SF_6. Hungary's quantified emission reduction commitment is 94 per cent as included in Annex B to the Kyoto Protocol.

107. Based on its base year emissions (123,034.090 Gg CO_2 equivalent) and its Kyoto Protocol quantified emission reduction commitment (94 per cent), Hungary originally calculated its assigned amount to be 578,260,222 tonnes CO_2 equivalent.

108. In response to inventory issues identified during the review, Hungary submitted revised estimates of its base year inventory – 115,397.149 Gg CO_2 equivalent – which resulted in a recalculation of the assigned amount. Based on the revised estimates, Hungary calculates its assigned amount to be 542,366,600 tonnes CO_2 equivalent. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

109. The calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1.

110. In its initial report, based on its national emissions in the most recently reviewed (2004) inventory – 83,952.541 Gg CO_2 equivalent – Hungary originally calculated its commitment period reserve to be 419,762,705 tonnes CO_2 equivalent. During the in-country review, Hungary presented to the ERT a revised estimate of its 2004 inventory – 83,923.740 Gg CO_2 equivalent – and a revised calculation of its commitment period reserve – 419,618,700 tonnes CO_2 equivalent. The ERT disagreed on this figure, because Hungary had included in its 2004 inventory total emissions of HFC-365mfc, which should only be reported as a memo item. The ERT's calculation of the commitment period reserve at this point was 419,616,741 tonnes CO_2 equivalent.

111. In response to inventory issues identified during the review, Hungary submitted revised estimates of its most recently reviewed (2004) inventory – 78,997.497 Gg CO_2 equivalent – which resulted in a recalculation of the commitment period reserve. Based on the revised estimates, Hungary calculates its commitment period reserve to be 394,987,486 tonnes CO_2 equivalent. The ERT agrees with this figure.

E. National registry

112. Hungary has provided almost all the information on the national registry system as required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1) in its initial report. The information provided is transparent and in accordance with the requirements of these reporting guidelines. During the in-country review the ERT was informed that the national Act on Implementation of the Kyoto Protocol was expected to be passed in May 2007, and that it will formalize the appointment of the registry administrator. In the meantime, until the law regulating the appointment was passed, the Ministry of Environment and Water had officially notified the National Inspectorate for Environment, Nature and Water as the registry administrator, with Mr. Ákos Dénes as the focal person. After the in-country review, Act LX of 2007 on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol was adopted on 29 May 2007 and came into force at the end of June 2007. Act LX appoints the National Inspectorate for Environment, Nature and Water as the registry administrator.

113. During the initial review visit, the ERT was provided with additional and updated information on the national registry of Hungary, which detailed the procedures for the safeguarding of data, the security plan, procedures for change management, and the initialization fact sheets which have been used in the Hungarian Emissions Trading Registry System and will be used under the Kyoto Protocol national registry. The ERT recommends Hungary to provide this information in its next inventory report under the Kyoto Protocol.

114. Table 5 summarizes the information on the mandatory reporting elements on the national registry system, as stipulated by decision 15/CMP.1 which describes how the national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1.

115. During the in-country visit, the ERT was informed that the internal operational testing of the registry for network connection was completed in January 2006 for the community independent transaction log (CITL). The initialization process for the international transaction log (ITL) was completed in July 2007 and the registry is expected to be fully operational by August 2007. Information on the registry is publicly available on the Internet at URL <http://www.hunetr.hu>. The ERT encouraged Hungary to complete the initialization testing early enough, and before August 2007, to allow the ERT to complete its review of the national registry. After the in-country review Hungary notified the ERT that the initialization test was completed on 27 July 2007.

116. The ERT was also informed about the procedures and security measures put in place to minimize discrepancies, terminate transactions and correct problems, and minimize operator error. These procedures and security measures included procedures for the safeguarding of data, a security plan, and procedures for change management.

117. The ERT acknowledged the effort made by Hungary to put in place adequate procedures and security measures for the registry to prevent unauthorized manipulations and to prevent operator error. Hungary has a hardware architecture of the system with two application servers and a database cluster, which ensures continuous availability and fast recovery in the event of a disaster. Hungary has a 24-hour entrance control and alarm system connected to the national police office and there is fire protection equipment in place. Hungary also intends to use digital certification and a virtual private network when the ITL becomes available. The ERT gained the overall impression that Hungary attaches sufficient importance, and has allocated adequate resources, including human resources, to the development, operation and maintenance of the registry.

Table 5. Summary of reporting on the national registry system

Reporting element	Provided / referenced	Comments
Registry administrator		
Name and contact information	Yes	
Cooperation with other Parties in a consolidated system		
Names of other Parties with which Hungary cooperates, or clarification that no such cooperation exists	Yes	Hungary indicates that its registry is not operated together in a consolidated form with the registries of other Parties.
Database structure and capacity of the national registry		
Description of the database structure	Yes	
Description of the capacity of the national registry	Yes	
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems	Yes	Covered in the independent assessment report (IAR)[a]
Procedures for minimizing and handling of discrepancies		
Description of the procedures employed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units	Yes	
Description of the steps taken to terminate transactions where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction	Yes	
Prevention of unauthorized manipulations and operator error		
An overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error	Yes	Covered in the IAR
An overview of how these measures are kept up to date	Yes	
User interface of the national registry		
A list of the information publicly accessible by means of the user interface to the national registry	Yes	Covered in the IAR
The Internet address of the interface to Hungary's national registry	Yes	<http://www.hunetr.hu>
Integrity of data storage and recovery		
A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster	Yes	Covered in the IAR
Test results		
The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems	Yes	Test results covered in the IAR

[a] Pursuant to decision 16/CP.10, the administrator of the international transaction log (ITL), once registry systems become operational, is requested to facilitate an interactive exercise, including with experts from Parties to the Kyoto Protocol not included in Annex I to the Convention, demonstrating the functioning of the ITL with other registry systems. The results of this exercise will be included in an independent assessment report (IAR). They will also be included in the annual report to the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

118. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report (IAR) that was forwarded to the ERT by the administrator of the ITL, pursuant to decision 16/CP.10, on 9 August 2007.

119. The ERT reiterated the main findings of this report, including that the registry has fulfilled sufficient obligations regarding conformity with the data exchange standards (DES). These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery.

120. The IAR identified some minor limitations in the state of readiness of the registry, including the following: the test plan has not yet been completed in full; and there is insufficient evidence for the existence of a formal incident management process. These minor limitations are to be rectified before the registry is fully operational with the ITL, and not later than the end of 2007.

121. Based on the results of the in-country review and the technical assessment, as reported in the IAR, the ERT concluded that Hungary's national registry is sufficiently compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding operational performance or public availability of information prior to the operational phase.

F. Land use, land-use change and forestry parameters and election of activities

122. Table 6 shows Hungary's choice of parameters for forest definition as well as its elections for Article 3, paragraphs 3 and 4, activities in accordance with decision 16/CMP.1.

Table 6. Selection of LULUCF parameters

Parameters for forest definition		
Minimum tree cover	30%	
Minimum land area	0.5 ha	
Minimum tree height	5 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3.3 activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Annual
Deforestation	Mandatory	Annual
Article 3.4 activities		
Forest land management	Elected	Annual
Cropland management	Not elected	Not applicable
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

123. The elected parameter values for the definition of forest are within the ranges prescribed in paragraph 1(a) of the annex to decision 16/CMP.1. In addition to the mandatory parameters in the definition of forest, Hungary provides in its initial report a single minimum width of forest area of 10 metres defined by the methodology of the current forest inventory in the country. The ERT recommends Hungary to pay special attention to the development of a reliable system for identifying land-use changes, and in particular deforestation activities under Article 3, paragraph 3.

III. Conclusions and recommendations

A. Conclusions

124. The information in the initial report generally covers the elements required by paragraphs 5, 6, 7 and 8 of the annex to decision 13/CMP.1, section I of the annex to decision 15/CMP.1, and relevant decisions of the CMP. Additional information on all elements was provided to the ERT during the in-country review.

125. Hungary's national system is generally prepared in accordance with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1). During the in-country review the ERT noted that the presentation of some of the mandatory elements of the national system is not fully in line with Article 5.1 of the Kyoto Protocol and requested Hungary to provide additional information. After the in-country visit, Hungary provided the required additional information and the ERT concluded that the national system is fully in line with the guidelines for national systems.

126. Hungary has provided its GHG inventory data for the base year (the average of the three years 1985, 1986 and 1987) and the years 1985–2004, and has included most of the tables required with data on all relevant gases and categories. Hungary's GHG inventory is in general accurate, as defined in the UNFCCC reporting guidelines, and is consistent with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. During the in-country review the ERT identified a few categories where methods or EFs used were not fully in accordance with the IPCC good practice guidance and this might lead to overestimation of emissions in the base year or underestimation of emissions in the most recent years. The ERT recommended Hungary to revise its estimates for these categories. After the in-country review, Hungary provided revised estimates for these categories for the base year and 2004 in accordance with the recommendations of the ERT and in line with the IPCC good practice guidance.

127. Hungary responded to the identification of potential problems during the review by providing additional information and submitting revised estimates. The ERT noted that Hungary provided timely and thorough replies to its questions concerning potential problems, following the ERT's recommendations and in line with the relevant reporting guidelines and CMP decisions.

128. The ERT did not recommend any adjustments to Hungary's GHG inventory, and noted that the assigned amount and commitment period reserve, as calculated to incorporate the revised estimates submitted during the review, are in accordance with the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol (decision 13/CMP.1) and decision 11/CMP.1. The ERT confirms that Hungary's assigned amount is 542,366,600 tonnes CO_2 equivalent based on its base year emissions (115,397.149 Gg CO_2 equivalent, including the revised estimates provided) and its Kyoto Protocol emission reduction commitment of 94 per cent, and that Hungary's commitment period reserve is 394,987,486 tonnes CO_2 equivalent based on its 2004 emissions (78,997.497 Gg CO_2 equivalent, including the revised estimates provided). The ERT agrees with these figures.

129. Hungary has also identified all the required information on parameters and elections for LULUCF under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in accordance with decision 16/CMP.1. This includes minimum tree crown cover of 30 per cent, minimum land area of 0.5 ha and minimum tree height of 5 metres. Hungary has chosen to account for forest management under Article 3, paragraph 4 activities and has chosen to account for Article 3, paragraphs 3 and 4, activities annually.

130. Hungary has provided all the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). During the initial review visit, the ERT was provided with additional and updated information on the national registry. The information provided is transparent and in accordance with the guidelines.

131. After the in-country review Hungary provided the ERT with updated information which indicates that Act LX of 2007 on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol was adopted on 29 May 2007 and came into force at the end of June 2007. Act LX appoints the National Inspectorate for Environment, Nature and Water as the registry administrator.

132. Based on the results of the in-country review and the technical assessment, as reported in the IAR, the ERT concluded that Hungary's national registry is sufficiently compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1.

B. Recommendations

133. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of Hungary's information presented in the initial report. Most of the recommendations were implemented during the review process, including those relating to the national system, and the potential problems that could have led to overestimation of emissions in the base year have been resolved. The key remaining recommendations[7] are that Hungary:

(a) Meet the 2007 deadline set to adopt all the necessary legal instruments for the formalization of the national system regarding legal and procedural arrangements foreseen under the Act LX of 2007 on the implementation framework of the United Nations Framework Convention on Climate Change and the Kyoto Protocol and the related governmental decrees;

(b) Further elaborate the existing QA/QC plan in line with the requirements of the IPCC good practice guidance, including extensive tier 2 checking procedures for key categories, a procedure for official approval of recalculations, and QA/QC procedures for activities related to Article 3, paragraphs 3 and 4, of the Kyoto Protocol; and additionally elaborate guidance for prioritizing inventory improvements;

(c) Nominate an archive manager who has exclusive access and administrative rights; prepare a procedural manual for the management and maintenance of the archiving system; and ensure the archiving of the supplementary information related to Article 3, paragraphs 3 and 4, of the Kyoto Protocol in a similar way;

(d) Continue to transfer all relevant inventory information into the central archiving system, giving priority to the base year and the most recent year, and report updated information on the archiving system in its next submission;

(e) Rectify minor issues identified in the IAR concerning documentation before the national registry is fully operational with the ITL, and not later than the end of 2007.

134. The ERT also formulated a number of recommendations relating to Hungary's GHG inventory submission. The key recommendations[8] are that Hungary:

(a) Provide a more detailed description of the approaches taken and the underlying assumptions used for the uncertainty estimates in the NIR;

(b) Improve the transparency of the estimates by providing in its NIR more precise descriptions and documentation of methodologies and EFs that differ from those of the IPCC, and provide better explanations of the fluctuations in IEFs;

[7] For a complete list of recommendations, the relevant sections of this report should be consulted.
[8] For a complete list of recommendations, the relevant sections of this report should be consulted.

(c) Improve the consistency of its reporting by cross-checking the information provided in the NIR with that in the CRF tables;

(d) Elaborate a detailed inventory manual for inventory planning and management, reflecting national circumstances;

(e) Strengthen its institutional capacity by ensuring adequate long-term financial support for inventory-related contracts and arrangements and by encouraging inventory experts to attend the UNFCCC training courses;

(f) Collect AD and develop well-documented country-specific EFs for use with higher-tier methods for key categories.

C. Questions of implementation

135. No questions of implementation were identified by the ERT during the initial review.

Annex I

Documents and information used during the review

A. Reference documents

IPCC. Good practice guidance and uncertainty management in national greenhouse gas inventories, 2000. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

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UNFCCC secretariat. Hungary: Independent assessment report of the national registry of Hungary. Reg_IAR_HU_2007_1. Will be available at <http://www.unfccc.int>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Gabor Kis-Kovacs (Hungarian Meteorological Service) and Mr. Lazslo Gaspar (Ministry of Environment and Water of Hungary), including additional material on the methodologies and assumptions used.

Additional information on emissions calculation based on the reference approach in the energy sector. Table 1.A.(b). Sectoral background data for energy, CO_2 from fuel combustion activities – reference approach. Liquid fuel/Gas/Diesel Oil, Submission v1.1. Inventory 1985–87, draft.

Additional information on the calculation of emissions in the waste sector. Amendments based on expert judgement 10 March 2007. Provided in electronic form in an Excel worksheet.

ERM Hungaria Kft. 2005. *Scoping study on National System*(Az uveghazhatast okozo gazok kibocsatasi leltaranak felulvizsgalati dokumentacioja).

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Governmental decree on the Implementation of the Act on Emission Trading, 143/2005. (VII. 27) (Korm. rendelet az uveghazhatasu gazok kiboscatasi egysegenek kereskedelmerol szolo 2005. evi. XV. torveny vegrehajtasanak egyes szabalyairol).

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Hungarian Meteorological Service. QA/QC plan, *QA/QC TERV 2007.03.01 –tol-2007.08.15-ig* (3 pages; in Hungarian).

Hungarian Meteorological Service. Statute, *Elnoki utasitas*, internal document 3/2007.(III.01.) OMSZ utasitas, showing the structure of the OMSZ and listing the activities of the GHG Division (all in Hungarian).

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Kis-Kovacs, Gabor. QA/QC checking table.

Municipal Public Services Co, Ltd. Waste-to-Energy Plant Budapest, available at <http://www.fkf.hu> (web search on 8 March 2007).

National Inventory Report 2007, draft March 2007, A2.1. Sources of the country-specific emission factors.

National legal framework, Summary (in English), related legal acts (in Hungarian).

Annex II

Acronyms and abbreviations

AD	activity data
AWMS	animal waste management system
Bo	methane producing capacity
BOD	biochemical oxygen demand
CH_4	methane
CMP	Conference of the Parties serving as the Meeting of the Parties
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
EC	European Community
EIT	economy in transition
EF	emission factor
ERT	expert review team
ETS	emissions trading scheme
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GJ	gigajoule (1 GJ = 10^9 joule)
GWP	global warming potential
HFCs	hydrofluorocarbons
IAR	independent assessment report
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITL	international transaction log
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane conversion factor
MEW	Ministry for Environment and Water
Mg	megagram (1 Mg = 1 tonne)
$MgCO_3$	magnesium carbonate
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
OMSZ	Hungarian Meteorological Service
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
SWDS	solid waste disposal site
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule
UNFCCC	United Nations Framework Convention on Climate Change

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