COMPLIANCE COMMITTEE

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25 March 2011

Report of the in-depth review of the fifth national communication of Hungary

Note by the secretariat

The report of the in-depth review of the fifth national communication of Hungary was published on 24 March 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.5/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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Framework Convention on Climate Change

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Report of the in-depth review of the fifth national communication of Hungary

Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of Hungary conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

Contents

I. Introduction and summary

A. Introduction

1. For Hungary, the Convention entered into force on 25 May 1994 and the Kyoto Protocol on 16 February 2005. Under the Kyoto Protocol, Hungary committed itself to reducing its net greenhouse gas (GHG) emissions by 6 per cent compared with the average level for the period 1985–1987 (base year)[1] during the first commitment period from 2008 to 2012.

2. This report covers the in-country in-depth review (IDR) of the fifth national communication (NC5) of Hungary, coordinated by the 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 18 to 23 October 2010 in Budapest, Hungary, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Valentina Idrissova (Kazakhstan), Mr. Mahendra Kumar (Fiji), Mr. Stephan Leinert (Ireland) and Mr. Simon Wear (New Zealand). Mr. Kumar and Mr. Wear were the lead reviewers. The review was coordinated by Ms. Xuehong Wang (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each section of the NC5. The ERT also evaluated the supplementary information provided by Hungary as a part of the NC5 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Hungary in its 2010 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

4. In accordance with 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

5. The ERT noted that Hungary's NC5 complies in general with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in the NC5. Hungary considered most of the recommendations provided in the report on the in-depth review of the fourth national communication (NC4) of Hungary.[3] The ERT commended Hungary for its improved reporting.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above is generally complete and transparent. During the review, Hungary provided further relevant information which was considered by the ERT to be limited.

[1] "Base year" refers to the base year under the Kyoto Protocol, which for Hungary is the average level for the period 1985–1987 for carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), and 1995 for hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

[2] Decision 15/CMP.1, annex, chapter II.

[3] FCCC/IDR.4/HUN.

1. Completeness

7. The NC5 covers all of the sections required by the UNFCCC reporting guidelines and most of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol, except for information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol (see chapter II.G below). The NC5 does not include information required by the UNFCCC reporting guidelines on steps undertaken to limit or reduce GHG emissions from aviation and marine bunkers and on international activities relating to systematic observations, including Global Climate Observing System (GCOS) activities. Additional information on these issues was provided to the ERT during the review week. The ERT recommends that Hungary enhance the completeness of its reporting by providing this information in future national communications and that the Party ensure that this information is easily identifiable.

2. Transparency

8. The ERT acknowledged that Hungary's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is broadly transparent. The ERT noted that the NC5 is structured following the outline contained in the annex to the UNFCCC reporting guidelines and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is identifiable.

9. In the course of the review, the ERT formulated a number of recommendations that could help Hungary to further increase the transparency of its reporting with regard to national circumstances (see para. 18 below); policies and measures (PaMs) (see paras. 29, 52, 54, 56, 57, 59, 61, 63 and 64 below); projections and the total effect of PaMs (see paras. 73, 75, 76 and 83 below); vulnerability, climate change impacts and adaptation (see paras. 90–93 below); research and systematic observation (see para. 94 below); education, training and public awareness (see para. 99 below); the description of the national system (see para. 23 below); the description of the national registry (see para. 26 below); information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol (see para. 88 below); and information on the minimization of adverse impacts (see para. 103 below).

3. Timeliness

10. The NC5 was submitted on 10 December 2009, before the deadline of 1 January 2010 mandated by decision 10/CP.13. The ERT commends Hungary for submitting the NC5 ahead of the due date.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures

11. In its NC5, Hungary has provided an overall description of the national circumstances and has elaborated on the framework legislation and key policy documents on climate change. The NC5 also refers to the description of the national system provided in the national inventory report (NIR) of the 2009 annual submission. Further technical assessment of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B.1 of this report.

1. National circumstances

12. In its NC5, Hungary has provided a description of its national circumstances. Information has been provided on the government structure, population, geography, climate, settlement structure and building stock, economy and relevant economic sectors. However, the ERT noted that, while the national circumstances were well described in the NC5, the analysis of how these national circumstances and changes thereto affect GHG emissions and removals in Hungary could be further enhanced.

13. The ERT noted that the main drivers of emission trends in Hungary include overall restructuring and reducing the levels of economic activity, and restructuring of primary energy supply since Hungary undertook a transition from a centrally planned economy to a market-based economy that has taken place in the 1990s. Since 1995, the economy has grown, with associated small growth in energy consumption, while GHG emissions have remained relatively stable and have decreased even further since 2005 (see para. 18 below). The ERT encourages Hungary to improve the transparency of future national communications by providing more information on the changes in sectoral emissions (e.g. transport, energy, industrial and agricultural emissions) and the relationship between sectoral emissions and changes in activity, and on how the national circumstances are driving these changes. Further, the ERT encourages Hungary to report in further detail on: the Party's implementation of European Union (EU) legislation related to GHG emissions (including fluorinated gases (F-gases)); the decision-making process related to the mitigation and adaptation of GHG emissions; information related to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol; major improvements from previous national communications; and international bunkers. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

Table 1
Indicators relevant to greenhouse gas emissions and removals for Hungary

	1990	*1995*	*2000*	*2005*	*2008*	*Change[a] 1990–2000 (%)*	*Change 2000–2008 (%)*	*Change[a] 1990–2008 (%)*
Population (million)	10.4	10.3	10.2	10.1	10.0	–1.5	–1.7	–3.2
GDP (2000 USD billion using PPP)	115.1	102.1	123.7	152.2	160.8	7.5	30.0	39.8
TPES (Mtoe)	28.7	25.9	25.0	27.6	26.5	–12.8	5.9	–7.7
GDP per capita (2000 USD thousand using PPP)	11.1	9.9	12.1	15.1	16.0	9.2	32.2	44.4
TPES per capita (toe)	2.8	2.5	2.4	2.7	2.6	–11.4	7.7	–4.7
GHG emissions without LULUCF (Tg CO_2 eq)	114.5a	78.7	77.1	79.8	73.1	–32.7	–5.1	–36.1
GHG emissions with LULUCF (Tg CO_2 eq)	112.3a	71.9	75.9	75.3	68.6	–32.5	–9.5	–38.9
CO_2 emissions per capita (Mg)	8.2	5.9	5.7	6.0	5.6	–30.0	–2.3	–31.6
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	0.7	0.6	0.5	0.4	0.4	–35.9	–15.4	–45.8
GHG emissions per capita	11.0	7.6	7.5	7.9	7.3	–30.3	–3.5	–32.7

	1990	*1995*	*2000*	*2005*	*2008*	*Change[a] 1990–2000 (%)*	*Change 2000–2008 (%)*	*Change[a] 1990–2008 (%)*
(Mg CO_2 eq)								
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	1.0	0.8	0.6	0.5	0.5	–36.2	–27.0	–53.4

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

Sources: (1) GHG emissions data: Hungary's 2010 greenhouse gas inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

[a] For emissions, base year data are used instead of 1990 data, whereas GDP, TPES and population data are for 1990, which may lead to some inconsistency in the calculation of GHG emissions per capita and per GDP unit.

14. Hungary is a republic, consisting of 19 counties and a capital city, Budapest. The Prime Minister has a leading role in the executive branch and has the power to select and dismiss Cabinet ministers. The National Assembly initiates and approves legislation sponsored by the Prime Minister. Hungary acceded to the EU in 2004 and therefore complies with EU membership directives on climate change, and is a recipient of EU transitional finance. Hungary has been under government restructuring since the elections in April 2010. At the time of the in-country review, climate change policy coordination was the responsibility of the Ministry of National Economy. The ministry responsible for the environment (i.e. the Ministry of Rural Development) is the designated national authority for the national system. The Hungarian Meteorological Service (together with the Forestry Directorate of the Central Agricultural Office and the Forest Research Institute) is responsible for the national GHG inventory. Climate change policy is underpinned by the National Climate Change Strategy 2008–2025 (NCCS) and a significant proportion of the PaMs are implemented at the national level. The implementation of climate change policy is set out in the National Climate Change Programme. Further legislative arrangements and administrative procedures, including those for the national system and the national registry, are presented in chapters II.A.2–3 and II.B.

15. In accordance with Article 4, paragraph 6, of the Convention and decision 9/CP.2, Hungary, as a Party with an economy in transition (EIT), may use the average level of emissions for the period 1985–1987 as its base year.

16. Hungary has provided a summary of information on GHG emission trends for the period 1985–2007. This information is consistent with the 2009 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq) (given in the common reporting format (CRF)), are also provided in an annex to the NC5. During the review, the ERT assessed the recently submitted 2010 annual submission and has reflected the findings in this report.

17. Total GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 36.1 per cent between the base year and 2008, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 38.9 per cent. This was mainly attributed to CO_2 emissions, which decreased by 33.8 per cent over this period. Emissions of methane (CH_4) also decreased by 28.5 per cent, while emissions of nitrous oxide (N_2O) decreased by 56.9 per cent. Most of these decreases were experienced during the years 1987–1995 (trends for 1987–1995: CO_2

27.3 per cent, CH_4 21.3 per cent, N_2O 56.0 per cent and total GHGs 31.1 per cent). Emissions of F-gases accounted for about 0.30 per cent of total GHG emissions in 1995 and 1.28 per cent in 2008. Total GHG emissions have decreased, mostly due to GHG emission reductions in industry (manufacturing industries and industrial processes), agriculture and energy use in the sector "others" (residential and commercial sectors), driven chiefly by a decline in industrial output, restructuring and associated energy use, and agricultural production. During the same period that emissions from transport grew substantially, those from waste also increased. An analysis of the key drivers of sectoral GHG emission trends is provided in chapter II.B below. Table 2 provides an overview of GHG emissions by sector from the base year to 2008.

Table 2
Greenhouse gas emissions by sector in Hungary, 1990–2008

	GHG emissions (Tg CO_2 eq)							*Change (%)*		*Shares[a] by sector (%)*	
Sector	*BY*	*1990*	*1995*	*2000*	*2005*	*2007*	*2008*	*BY[a] –2008*	*2007 –2008*	*BY*	*2008*
1. Energy	82.9	70.5	60.8	57.8	59.8	56.7	55.5	–33.1	–2.1	72.3	75.9
A1. Energy industries	27.3	22.2	23.9	23.6	18.8	20.6	19.7	–27.8	–4.3	23.8	26.9
A2. Manufacturing industries and construction	20.1	15.0	11.0	8.5	8.7	7.2	7.0	–65.4	–3.7	17.6	9.5
A3. Transport	7.8	8.2	7.0	8.8	12.2	12.8	12.9	65.7	0.4	6.8	17.6
A4.–A5. Other	25.0	22.7	16.4	14.5	17.9	13.9	13.8	–44.7	–0.5	21.8	18.9
B. Fugitive emissions	2.7	2.4	2.5	2.5	2.2	2.2	2.1	–21.7	–1.1	2.4	2.9
2. Industrial processes	10.9	8.9	5.5	6.3	7.0	6.0	4.7	–56.5	–20.6	9.5	6.5
3. Solvent and other product use	0.3	0.2	0.2	0.2	0.4	0.4	0.4	42.8	11.0	0.2	0.6
4. Agriculture	17.5	14.5	8.7	9.1	8.8	8.9	8.8	–49.8	–1.4	15.3	12.0
5. LULUCF	–2.3	–2.9	–6.8	–1.2	–4.6	–2.9	–4.5	100.8	57.0	–2.0	–6.2
6. Waste	3.0	3.3	3.5	3.7	3.9	3.8	3.7	25.3	–1.6	2.6	5.1
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	**112.3**	**94.4**	**71.9**	**75.9**	**75.3**	**72.8**	**68.6**	**–38.9**	**–5.8**	**NA**	**NA**
GHG total without LULUCF	**114.5**	**97.4**	**78.7**	**77.1**	**79.8**	**75.7**	**73.1**	**–36.1**	**–3.4**	**100.0**	**100.0**

Abbreviations: BY = base year, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA= not applicable.

Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

18. After the sharp decline in emissions during the period 1987–1995, Hungary's GHG emissions remained relatively stable until 2005 against the backdrop of stable economic growth. This suggests a decoupling of economic growth from the GHG emissions for that period. Between 2008 and 2009, Hungary's emissions decreased even further, by 8.4 per

cent, mainly due to a decrease in energy consumption, the extreme mild winter in 2007, and modernization in the chemical industry. The ERT encourages Hungary to improve the transparency of the reporting on GHG emission trends by providing additional information on sector-specific trends and relevant drivers.

2. National system

19. In accordance with decision 15/CMP.1, Hungary provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The description includes all the elements as required in decision 15/CMP.1.

20. Hungary provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources. The National Forest Act of 2009 prioritizes natural regeneration and afforestation of land where applicable.

21. During the review, Hungary provided additional information on the national system, elaborating on the institutional and legislative arrangements and administrative procedures for GHG inventory planning, quality control/quality assurance (QA/QC), and training of experts. Further, Hungary provided information on the ongoing government restructuring and its implications for the national system. The ERT encourages Hungary to ensure that its national system continues to perform the required functions after the government restructuring has been completed and to report on the changes in the system in its next annual submission.

22. The ERT took note of the recommendations of the report of the individual review of the 2009 annual submission of Hungary[4] (the 2009 annual review report (ARR)). During the review, the ERT learned that Hungary had enacted Governmental Decree no. 345/2009 as an inventory-specific legal instrument, which provides the legal basis for inventory preparation (including LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (KP-LULUCF)). According to the decree, the ministry responsible for environment (i.e. the Ministry of Rural Development) is the designated authority for the national system, whereas the Hungarian Meteorological Service is the designated authority for the preparation of the GHG inventory. The decree contains provisions for mandatory data provision for inventory purposes. The ERT commends Hungary for its efforts to improve the legal and institutional arrangements related to the national system.

23. However, the ERT noted that KP-LULUCF information was not reported in the NC5 or in the 2010 annual submission. KP-LULUCF information was reported in the re-submission of the 2010 annual inventory on 8 November 2010. The ERT reiterates the recommendation of the 2009 ARR that Hungary report the activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and ensure that the national system provides a basis for such reporting. The ERT concluded that the national system continues to perform its required functions as set out in decision 19/CMP.1.

[4] Report of the individual review of the annual submission of Hungary submitted in 2009 (FCCC/ARR/2009/HUN).

3. National registry

24. In its NC5, Hungary has provided information on the national registry, including a description of how its national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and how it complies with the requirements of the technical standards for data exchange between registry systems.

25. During the review, Hungary provided additional information on the measures put in place to safeguard, maintain and recover registry data, and the security measures employed in the registry to prevent discrepancies and unauthorized manipulations of the national registry. In response to questions raised by the ERT, Hungary provided documents demonstrating how it records the changes related to the national registry and how it maintains these records. The ERT noted that all updates of databases and applications, implemented security measures, and changes to the national registry software are documented on a regular basis by the administrator of the national registry.

26. The ERT took note of the conclusion of the standard independent assessment report (SIAR) that the national registry continues to fulfil the requirements related to its reporting and accounting of information on Kyoto Protocol units, transaction procedures, conformance to the technical standards, public availability of information, security, data integrity and recovery measures. The ERT also took note of the recommendations of the 2009 ARR and 2010 SIAR. During the review, the ERT learned that the Party has addressed these recommendations and provided public information on the Hungarian national registry web page as well as an explanation in English of why the information is not available. The ERT reiterates the recommendation of the SIAR that public information which is currently available in the Hungarian language only should be translated into English. The ERT recommends that Hungary report how this issue has been addressed in its next national communication.

27. The ERT concluded that Hungary's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

28. As required by the UNFCCC reporting guidelines, Hungary has provided in its NC5 information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Each sector has its own textual description of the principal PaMs, supplemented by summary tables on PaMs by sector. Hungary has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention.

29. However, the ERT noted that the summary tables on PaMs by sector provided by Hungary were not complete. Some of the recommendations from the previous review were taken into consideration to improve reporting in the NC5, including the reporting of the projected effect of the EU emissions trading scheme (EU ETS). The information was provided for a range of scenarios with cost estimates but only in the chapter on projections and the total effect of PaMs. The ERT encourages Hungary to provide a best estimate of the projected effects of the EU ETS and other key PaMs in the PaMs chapter and to explain how any overlap (or double counting) with existing PaMs is treated. In addition, the ERT recommends that Hungary include information on PaMs to reduce emissions from aviation and marine bunkers and encourages Hungary to report in further detail on EU-related

directives (including the EU ETS) and the effects of agriculture and forestry PaMs on GHG emissions and to provide more information on the GHGs affected for all sectors in its next national communication.

30. Hungary provided comprehensive information on PaMs at the national level but only limited information at the regional level. The key framework for climate and energy policy is the NCCS 2008–2025. The National Climate Change Programme (NCCP) gives effect to the implementation of the strategy and the progress made in implementing the NCCS is reviewed every two years. The NCCS attaches priority to meeting the objectives of the EU directives and international conventions related to climate change that lead to a lower carbon economy, avoid adverse, ecological and social economic effects, and promote awareness of climate change.

31. Hungary expects to meet its Kyoto Protocol emission reduction target without any further measures. In accordance with the 'without measures' scenario, Hungary expects its emissions to be 11.8 per cent below the base year level compared to the Kyoto target of 6 per cent below the base year level. Hungary joined the EU ETS in 2005. Most emissions allowances are allocated freely during 2008–2012; however, from 2012, the quantity of free allowances will decrease by 17.4 per cent compared to the average annual total quantity of allowances currently issued by EU member States.

32. Improvements to the energy efficiency of the residential sector have provided the most cost-effective and biggest impact on reducing GHG emissions in Hungary. The Hungarian residential sector is dominated by large pre-fabricated apartment blocks built prior to the 1990s with low thermal efficiency, heated by district heating and commonly fuelled by oil and coal. Emissions from this sector decreased by 64 per cent in 2008 compared to the base year level due to energy-efficiency improvements and the shift from coal to gas in the residential sector. In the 1990s and 2000s, policies to improve energy efficiency in the residential sector were strengthened and their benefits, in terms of improving air quality and human health and providing employment opportunities during the recession, were recognized.

33. The NC5 provided estimates of the effects of PaMs by sector and by gas for most sectors except for the agriculture, industrial processes and waste sectors. During the review, the ERT was presented with additional information to explain that the reduction in agriculture emissions would predominantly be from N_2O.

34. Hungary has provided limited information on the implementation costs of PaMs. Retrofitting and improving the energy efficiency of the building stock has largely been funded through the Green Investment Scheme (GIS) with finance raised from the sale of assigned amount units (AAUs). Hungary has invested 7.5 billion Hungarian forint (HUF) from the GIS into retrofitting and improving the energy efficiency of the building stock. Hungary anticipates using the GIS further to fund investment in renewable energy supply.

35. Hungary has not reported on the PaMs in the agriculture sector that could potentially increase emissions through a growth in the output of livestock and cropping. As Hungary has received a lot of assistance in agriculture activities, this information is of particular importance. Hungary explained that none of the PaMs in the agricultural sector directly addressed GHG emission reduction. Further, the potential effects can hardly be quantified so that no precise information is available on the effects of PaMs on agriculture emissions. Hungary has provided limited information on the PaMs no longer in place compared to the NC4; in most cases this is because the legislation referred to in the NC4 has been superseded by new legislation. In general, most of the PaMs reported in the NC4 are still in place; however, the textual descriptions have changed. Table 3 provides a summary of the reported information on the PaMs of Hungary.

Table 3
Summary of information on policies and measures

Major policies and measures	*Examples/comments*
Policy framework and cross-sectoral measures	
National Climate Change Strategy (NCCS)	National framework for making climate change related decisions. The National Climate Change Programme is adopted every two years to implement the NCCS
Emissions trading	European Union emissions trading scheme (EU ETS) from 2005. The existing installations have been allocated an average of 26.1 Mt of CO_2 emission allowances per year during the period 2008–2012. About 13.1 Mt are reserved for new entrants during this period
Policies and measures by sector	
Energy	
National Energy Efficiency Action Plan (NEEAP)	The NEEAP spans from 2007 to 2013 and encompasses a number of national energy-saving programmes and measures, including the Energy Saving Credit Fund and the Energy Certificate
Promotion of renewable energy sources	The Renewable Energy Strategy (RES) includes feed-in-tariffs for renewables and waste, and certificates of origin for RES electricity. It also supports various projects, including those promoting biomass, biogas, geothermal energy and small-scale wind turbines
	In line with the EU renewable energy directive, the renewables target is set to be 13 per cent by 2020, which translates to 96 PJ based on a post-economic recession projection of energy supply
Energy-efficiency improvements	The Hungarian Energy Efficiency Strategy and Action Plan designates the following areas for policy intervention: residential buildings, institutional buildings, energy transformation, traffic and transport, architecture, and typical energy consumption product groups that may have a more significant influence on the volume of energy needs
	Energy efficiency in housing, funded through the Green Investment Scheme (GIS)
	Energy efficiency in communal residences, which includes the upgrading of district heating systems and the conversion from coal to gas
Combined heat and power generation	Obligatory takeover of electricity produced through combined heat and power
Nuclear power	Refurbishment and extension of existing capacity (6–10 Mt CO_2 eq)
Transport	
Renewable transport target	Target of 10% renewable transport through biofuels and electric motives (including passenger cars)
Road pricing	Tolls for heavy vehicles
Industrial processes	
Joint implementation	Project implemented to eliminate almost all N_2O emissions from nitric acid production
Fluorinated gases	Hungary is implementing the EU directive on F-gases

Major policies and measures	*Examples/comments*
Agriculture	
New Hungary Rural Development Strategic Plan	Increase of energy plantations and energy forests
	EU nitrates directive
	Modernization of agriculture livestock production, crop production and machinery
	Financial support for improved environmental management and animal management
Forestry	
Afforestation	Grants for afforestation
	Restrictions on deforestation: any deforestation must be offset with equal or greater afforestation elsewhere
	Emphasis on natural regeneration and the return to the natural state wherever possible
Waste	
	Waste prevention (including hazardous waste) and packaging reduction, as mandated by the EU
	Landfill gas flaring or capture if economically viable
	Upgrading waste incineration in Budapest, employing heat used for electricity and district heating
	Reduction of landfill sites and rehabilitation of old sites

Note: The greenhouse gas emission reduction estimates given for some measures (in parentheses) are reductions in CO_2 or CO_2 eq for the year 2020.

1. Policy framework and cross-sectoral measures

36. At the time of submitting the NC5, the Ministry for Environment and Water was responsible for climate change policy. However, under the new government structure, the Ministry for National Development and Economy is now responsible for climate change policy. Policies related to agriculture and forestry are within the competency of the Ministry of Rural Development. The Ministry for National Development and Economy is responsible for monitoring and evaluating the implementation of policies and conducts ad hoc reviews of national climate change programmes. The central government establishes the guidelines for climate change related policies for local government and provides funding to local government for specific climate-change projects.

37. Municipal authorities, within their competency, are required to follow the guidelines for the implementation of climate change policies of the central government. Wherever municipal authorities receive funds from the central government to improve the energy efficiency of public buildings (e.g. schools and hospitals) they are subject to verification by the central government. The central government also provides awareness-raising programmes and consultation to municipalities to improve energy efficiency. Municipal authorities closely monitor the local energy demand and many operate district heating systems. Further development of district heating is seen as a significant emissions abatement opportunity in Hungary.

38. The current climate change policy is elaborated in the NCCS 2008–2025. The NCCS sets out the overall strategy for Hungary to address climate change, including mitigation and adaptation, as well as the communication of climate change. The NCCS was to be reviewed after two years and then every five years. However, the 2010 review was deferred to 2011 because of a substantive government restructuring and the preparation for the presidency of the EU during the first half of 2011. The NCCP implements the climate change measures outlined in the NCCS and is reviewed every two years, and a new two-year programme is produced.

39. Hungary's 2020 pledged emissions reduction target compared to 1990 levels is a reduction of 16–25 per cent if the EU target is 20 per cent, or a reduction of 27–34 per cent if the EU target is 30 per cent. The target for 2050 is a reduction of 80 per cent, and Hungary's vision for 2050 will be further elaborated in the revised NCCS during 2011. The higher end of the less stringent target (16–25 per cent) is commensurate with the 'with measures' projected reduction relative to 1990 of 26 per cent, and the higher end of the more stringent target (27–34 per cent) is commensurate with the projected reduction in emissions under the 'with additional measures' projection for 2020 relative to 1990. Hungary could be expected to meet the less stringent target with existing measures and the more stringent target with additional measures. Hungary has not reported on how it intends to make use of forestry removals to meet its 2020 and 2050 targets.

40. Under the EU directive on energy efficiency, Hungary is to improve energy efficiency by 20 per cent between 2008 and 2020 in the non-EU ETS trading sector. The energy efficiency allocation plan is yet to enter into force. EU directive 2009/28/EK sets a renewable energy target for Hungary's primary energy supply of 13 per cent by 2020.

41. Hungary complies with the climate change related directives of the EU; however, much of the information relating to those directives is not reported and is not sufficiently transparent for a non-EU audience. The transparency of Hungary's national communications could be improved through the provision of short descriptions of EU directives in the chapter on PaMs or in an annex to it. Hungary is planning to implement the EU directive on F-gases.

42. Under the EU renewable energy directive (2009/29/EK), Hungary's target is to meet 13 per cent of total primary energy demand from renewable sources. The target, in absolute terms, equates to 96 PJ (13 per cent of total projected energy supply in 2020 of 740 PJ) by 2020 and was lowered to take into consideration lower-than-expected energy demand in 2020 due to the recent global financial recession. The transport sector's target is to meet 10 per cent of its energy demand from renewable sources, including biofuels and the electrification of road and rail transport. In addition, energy efficiency is to be improved by 20 per cent between 2008 and 2020 in the non-EU ETS trading sector. The energy efficiency allocation plan is yet to enter into force.

2. Policies and measures in the energy sector

43. Between the base year and 2008, GHG emissions from the energy sector decreased by 33.1 per cent (27,392.9 Gg CO_2 eq), mainly driven by reductions in energy demand in manufacturing industries and construction (–65.4 per cent or –13,154.6 Gg CO_2 eq), and in the residential sector (–45.8 per cent or –7,643.4 Gg CO_2 eq). Between the base year and 1993, Hungary's economic activity was substantially reduced during the transition to a market-based economy, causing the large reduction in emissions from manufacturing industries and construction. Emissions from the residential and commercial sectors were reduced by the shift from coal-fired to natural gas in heating plants and improvements in the thermal efficiency of the residential and commercial sectors.

44. ***Energy supply.*** The share of fossil-based fuel consumption in Hungary's energy supply declined from 1990 to 2007 due to changes in economic activity. Between 1990 and 2007, coal consumption decreased by 60 per cent (from 186.4 to 74.2 PJ), oil consumption decreased by 57 per cent (from 80.9 to 35.1 PJ), and gas consumption decreased by 47 per cent (from 159.6 to 83.9 PJ). Over the same period, nuclear power increased by 7 per cent (from 149.7 to 160 PJ), and renewables are estimated to have increased by 65 per cent (from 18.5 to 30.6 PJ). The ERT noted that Hungary also intends to make use of geothermal heat for district heating.

45. Nuclear power provided almost 40 per cent of Hungary's electricity supply in 2007. Hungary has implemented a parliamentary decree to extend the lifetime of the existing nuclear power plant and to increase the capacity of each of the four units from 440 MW to 500 MW. The refurbishment will ensure that at least 40 per cent of future electricity needs are met from nuclear power. Depending on the assumed fuel mix for generation, the refurbishment of the nuclear power plant will reduce Hungary's GHG emissions by 6–10 Mt CO_2 eq annually.

46. ***Renewable energy sources.*** The renewable energy target has been set using energy projections made since the onset of the global recession, as expectations of future energy demand are now lower than projected before the recession. Preliminary sectoral targets to achieve this aggregate target are divided as follows: 14.3 per cent for heating and cooling, 13.8 per cent for power generation and 10 per cent for transport. The ERT noted that Hungary has not yet determined how the renewable target will be financed but that the Party expects to make use of GIS funds.

47. ***Energy efficiency.*** Hungary has successfully reduced GHG emissions in the energy sector by increasing the energy efficiency of buildings, and the estimates suggest that there is still scope for further improvement. Buildings in need of thermal efficiency improvements are firstly graded for their thermal efficiency. The building owner finances the improvements to their building and the building is then graded again for thermal efficiency. A grant of up to 60 per cent is paid for successful improvements. Larger grants may be paid if the upgrade exceeds expectations and a higher grade is achieved. Funding for the programme is provided from the GIS. The returns, in terms of energy savings to the programme, are high. From an initial investment of HUF 3.3 billion, the energy savings are estimated to be HUF 30 billion. The benefits of the scheme appear large and could possibly occur under 'business as usual'. The ERT noted the need for Hungary to continue to re-evaluate the scheme in order to ensure that the improvements do not occur under 'business as usual' and because the benefits of the scheme are likely to diminish over time as energy efficiency is improved.

48. ***Residential and commercial sectors.*** Emissions from the residential and commercial sectors have decreased from 16.7 Mt CO_2 eq to 9.1 Mt CO_2 eq between the base year and 2008. The reduction is largely due to improvements in energy efficiency and the shift from coal-fired heating to gas as well as improvements to the thermal efficiency of pre-1992 residential and commercial buildings. Other PaMs for the residential sector include: voluntary measures and awareness-raising campaigns, including labelling of appliances and household boilers; and financial incentives for the replacement of refrigerators and freezers with more efficient appliances. Buildings in Hungary are required to have energy rating certificates prior to sale.

49. ***Transport sector.*** In contrast to the other sectors where emissions declined, emissions from the transport sector increased by 65.7 per cent during the period 1990–2008. This reflects changes in lifestyle and a major shift from public transport to private cars. The transport fleet underwent significant modernization during the 1990s and up to 2004, from an old car fleet with a high proportion of 2-stroke engines to modern vehicles meeting EU emissions standards. However, the average age of the cars increased from 10.5

years to 11.7 years between 2004 and 2008, largely due to financial difficulties preventing individuals from financing new vehicles. Hungary's road infrastructure is still expanding in order to catch up with the level of road infrastructure in more developed EU countries. Hungary applies a differentiated road tax on purchases of motor vehicles (irrespective of age) graduated on emissions standards, which is in inverse relationship to the vehicle emissions standard. Environmental testing for smoky vehicles was previously annual for cars older than four years. In recent years, each car has to go through a mechanical test every second year; however, this also includes environmental testing. The ERT noted that compliance with vehicle testing is still strictly enforced, but with less frequency, which is more cost-effective for the vehicle owners.

50. Hungary, under the terms of the EU directive on renewable energy, is required to meet 5.75 per cent of its transport energy demand from renewable sources by 2010. The current share of biofuels (diesel and gasoline) is 4.4 per cent. The renewables target for transport is not restricted to biofuels and can include the electrification of most modes of transport, including motor vehicles.

51. Hungary has a 10 per cent domestic reduction target for emissions from transport relative to projected transport emissions in 2020. Much of the emissions reduction is expected to be made through the renewables transport target. Other transport policies include: the improved integration of public transport systems; park and ride systems; the modernization of the transport fleet; and tolls on heavy vehicles. The ERT noted that the existing measures in the transport sector are expected to reduce transport emissions by 7 per cent relative to projected transport emissions in 2020. How the remaining 3 per cent emissions reduction will be achieved remains unclear. The ERT encourages Hungary to further explain how it plans to close the projected 3 per cent gap in transport emissions in its next national communication. The introduction of more stringent emission standards and the EU-wide regulation on decreasing the GHG emissions (caps) of a producer's car fleet will help to close the gap.

52. Emissions from aviation bunkers will be covered by the EU ETS from 2012. Emissions from marine bunkers are not addressed in the Party's NC5. Hungary is land-locked but can use the Danube River for some international shipping. Currently, there are no Hungarian flagged ships engaged in international shipping on the Danube River. Shipping on the Danube River is largely unscheduled and informal, over which Hungary has no specific jurisdiction. Historically, Hungary has used the Danube River for freight transportation and believes that an opportunity exists to use the river for freight transport, again with a view to reducing road freight emissions. The ERT recommends that Hungary report on policies to reduce emissions from international bunker fuels and mitigation effects on all GHGs (i.e. including N_2O and CH_4) in future national communications.

53. ***Industrial sector.*** The focus of PaMs in the industrial sector is on improving energy efficiency through financial support programmes, energy audits and voluntary programmes. Funding is available through financial assistance on a grant basis provided by the EU programme, Poland and Hungary: Assistance for Restructuring their Economies (PHARE). Funds have been set aside to increase renewable energy and reduce energy loss in energy carriers. Beneficiaries also include municipalities, and private and municipality-owned companies. The technologies are mainly efficient street lighting, small-scale combined heat and power systems, improvements of production processes and – to a lesser extent – projects involving renewable energies.

54. Financial incentives in the form of grants are also available under the efficient energy consumption instrument to reduce energy consumption in buildings and to modernize district heating and buildings for small- and medium-sized enterprises. Large energy consumers are required by law to employ an energy manager and to report on energy consumption and efforts being implemented to improve energy efficiency. The ERT

noted that the reporting of PaMs in the industrial sector of the NC5 could be improved by separating out the activities related to the non-industrial sector (e.g. improving the efficiency of street lighting) and wherever several PaMs target one activity (e.g. improving boiler efficiency). The transparency of the NC5 could be improved by explaining how the double counting of PaMs is avoided.

3. Policies and measures in other sectors

55. Between the base year and 2008, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 44.2 per cent (14,013 Gg CO_2 eq), mainly driven by reductions in emissions from agriculture and industrial processes. The trend in GHG emissions from industrial processes (including solvents and other product use) showed a notable decrease of 54.0 per cent (or 6,039 Gg CO_2 eq). The decrease in emissions from agriculture was of the same range, 49.8 per cent (or 8,728 Gg CO_2 eq). In contrast, emissions from the waste sector increased by 25.3 per cent (753 Gg CO_2 eq).

56. ***Industrial processes.*** The decrease in GHG emissions from the industrial processes sector (including solvents and other product use) between the base year and 2008 was mainly driven by reductions in economic activity and the closing down of some industrial facilities following Hungary's transition to a market economy. A joint implementation project also contributed to a reduction of N_2O emissions from nitric acid production by 1,423 Gg CO_2 eq between 2006 and 2008. This project was described in the 2010 annual submission but was not reported in the NC5. During the review, Hungary provided the ERT with information on its plans to comply with a new EU directive on F-gases. The ERT recommends that Hungary report on projects and PaMs to reduce emissions in future national communications and provide the information subdivided by gas.

57. ***Agriculture.*** Between the base year and 2008, the decrease in GHG emissions from the agriculture sector was mainly driven by reductions in agriculture activity following Hungary's transition to a market economy. Total emission reductions due to agriculture measures were reported to be 1,244.56 Gg CO_2 eq by the year 2020; however, information on the effect of agriculture policies was not provided separately for N_2O and CH_4 emissions. During the review, the ERT noted that most of the abatement in agricultural emissions was expected to come from reduced emissions of N_2O driven by the implementation of the EU nitrates directive. The focus of the implementation of this directive in Hungary is on improved farming practices. The ERT noted that the transparency of the NC5 could be enhanced through the provision of more specific information on how the directive is applied in Hungary and on the scale of its impact on emission reductions.

58. During the review, the ERT was presented with additional information to explain that most of the reduction in agriculture emissions would be from N_2O from protein forage optimization and derived nitrogen (N) excretion reductions. The N excretion reductions are driven by EU directives and implemented through improved farming practices. PaMs were modelled jointly to correctly account for the overlap (or double counting) between policies.

59. Other PaMs in the agriculture sector focus on the modernization of farming systems, financial support for improved environmental practices and afforestation on agricultural land. The NC5 lacks information on the effects of policies and the description of policies is not transparent. Some policies seem to support increased agricultural activity and hence emissions; however, the effects of these policies were not reported. The ERT recommends that Hungary report on PaMs in the agriculture sector in future national communications, with a clear explanation of how the PaMs are implemented and on the effect of PaMs by gas (i.e. CH_4 and N_2O). The ERT also recommends that Hungary report the effect that policies to promote agriculture activity may have on GHG emissions.

60. ***LULUCF.*** The LULUCF sector was a net removal of 4,515 Gg CO_2 eq in Hungary in 2008 and the net GHG removal increased by 2,267 Gg CO_2 eq from the base year. The trend was mainly driven by afforestation policies. Information on policies to effect LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol was not provided in the NC5.

61. Hungary has implemented a new Forestry Act of 2009 replacing the 1996 Forestry Act. The emphasis of forestry policy in Hungary is on the promotion of afforestation. In accordance with this policy, any deforestation (settlements and highways) must be compensated by an equivalent or greater amount of afforestation elsewhere. Deforestation for agriculture and over-thinning is not permitted. Forests must be allowed to regenerate to the most natural state possible wherever applicable. Until 2004, funding for afforestation was provided by the Hungarian Government but now the EU provides funding for most of the afforestation activities. Within the agri-environmental programme, 44,000 ha have been approved for afforestation, and the total area for afforestation under the programme (69,000 ha) appears feasible. After the in-country review, Hungary provided the ERT with more information about the effects of PaMs in the forestry sector which was reported in the re-submission of the 2010 annual inventory on 8 November 2010. According to the report, removals in 2008 totalled 1.16 Mt CO_2 from afforestation and reforestation activities and 2.8 Mt CO_2 from forest management activities under Article 3, paragraph 4. The ERT recommends that Hungary provide more information in future national communications on the effects of forestry PaMs on net emissions, and clearly explain how the policies affect LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

62. ***Waste management.*** Between the base year and 2008, GHG emissions from the waste sector increased by 25.3 per cent (or 753 Gg CO_2 eq). Information on the effects of policies on the waste sector by gas has not been provided. The key policy to reduce waste and waste emissions is implemented in the context of the EU waste management directive and is under transposition into domestic legislation. The directive focuses on waste prevention and minimization, separation, reuse and recycling. This includes the prevention of hazardous waste and the reduction of the amount of packaging.

63. The number of solid waste disposal sites across Hungary was approximately 2,600 in 2002, of which only 1,000 sites operated. Between 2002 and 15 July 2009 their number decreased to 75, out of which the number of municipal solid waste disposal sites dropped from approximately 150 to 57. Closed sites are rehabilitated and checked to ensure that there is no wastewater leaching. Landfill sites are assessed for landfill gas capacity. Sites determined to have a positive economic value of landfill gas use landfill capture, otherwise the gases are flared. Whether the gas is captured or flared depends on the economic assessment. Information on three joint implementation (JI) projects to recover methane from abandoned landfill sites was provided to the ERT during the review. One waste management facility in Budapest has been retrofitted and the waste is burned for district heating and electricity generation. The ERT recommends that Hungary provide more information in future national communications on the effects of waste PaMs on emissions and report the effects of these PaMs on GHGs (i.e. CO_2, N_2O and CH_4).

64. The ERT noted that transparency in the PaMs section could be enhanced through the provision of more detailed information on how PaMs are influenced by the EU directives. Information on how PaMs in the agriculture sector are assessed and estimated could also be provided. The ERT recommends that Hungary report the effects of the PaMs on agriculture emissions by gas and the effects of the New Hungary Rural Development Programme on agriculture emissions in future national communications. The ERT further noted that the transparency of future national communications could be improved by showing how national circumstances and government decision-making affect the policy development process and how the policies are affecting emissions.

4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol

65. In its NC5, Hungary did not report information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Information on how Hungary strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on the developing country Parties, as reported in the 2010 annual submission, is presented in chapter II.H of this report.

66. Hungary provided some of the information below during the review. Hungary has implemented several initiatives which aim to minimize the adverse effects of climate change on other countries, including the allocation of EUR 6 million to developing countries as part of the 'fast-start' package announced at the United Nations Climate Change Conference in Copenhagen. Among the EUR 6 million, EUR 1 million has been committed for 2010 for the Least Developed Countries Fund (LDCF), EUR 2 million has been committed for 2011 and the balance of EUR 3 million has been committed for 2012. The Ministry for Foreign Affairs is developing a long-term official development assistance (ODA) strategy for climate change. Gas and oil purchases are mostly sourced from the Russian Federation and, therefore, Hungary's climate change policies that might affect the level of oil consumption are not likely to have an impact on oil-exporting developing countries. In addition, Hungary strives to ensure that feedstock for biofuels is locally sourced so as to avoid contributing to food shortages in developing countries.

C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms

67. In its NC5, Hungary has provided comprehensive information on its projections for all GHG emissions, following the Intergovernmental Panel on Climate Change (IPCC) sector and source categories, under a 'with measures' scenario, a 'with additional measures' scenario and a 'without measures' scenario. There have been no updated projections since the submission of the NC5.

1. Projections overview, methodology and key assumptions

68. The GHG emission projections provided by Hungary in the NC5 include a 'with measures' (called 'with existing measures' in the NC5), a 'with additional measures' and a 'without measures' scenario until 2020, presented relative to actual inventory data for the time series 1990–2006. Projections are presented on a sectoral basis in tabular form, using the same sectoral categories used in the PaMs section, for the years 2005, 2010, 2015 and 2020, and on a gas-by-gas basis for the following GHGs: CO_2, CH_4, N_2O, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) (treating PFCs and HFCs collectively in each case). Projections are also provided in an aggregated format for each sector as well as for a national total, using global warming potential (GWP) values. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals. Further, emission projections on bunker fuels were reported as a graph, without any explanations in the text.

69. Compared to the NC4, projections are now provided also for PFCs, HFCs, SF_6 and solvent and other product use. The bottom-up approach used in the NC5 to calculate 'useful energy' is an improvement compared to the NC4 where energy demand was projected on

the basis of fuel use, since it allows the simulation of fuel switching as a result of policy changes. The ERT commends Hungary for implementing this improvement.

70. However, the ERT noted that Hungary did not provide the projections in tabular format on a gas-by-gas basis within each sector for the years 2005, 2010, 2015 and 2020. The ERT further noted that Hungary did not provide projections of the following indirect GHGs: carbon monoxide (CO), nitrogen oxide (NO_X), non-methane volatile organic compounds (NMVOCs), and sulphur dioxide (SO_2) in the NC5. The ERT therefore encourages Hungary to provide this information in future national communications.

71. Hungary submitted three scenarios in its NC5, with 2005 as the starting year: (a) a 'without measures' (WOM) scenario, also called the 'baseline' scenario, which is presented as a theoretical trend line for comparison under the assumption of "frozen technology" (no efficiency improvements in the power sector and energy demand, and no increase in the renewables share), while activities change; (b) a 'with measures' (WM) scenario (called 'with existing measures' in the NC5), which includes the effects of full implementation of existing and adopted measures, as well as the assumption that renewables targets will be met according to the base case in the Renewable Energy Strategy (RES) (an 11–13 per cent renewables share of total primary energy consumption by 2020); and (c) a 'with additional measures' (WAM) scenario, which assumes that renewables targets will be met according to the more ambitious scenario defined in the RES (a 13–15 per cent renewables share of total primary energy consumption by 2020), and that other planned and possible new measures will be implemented, additional to the ones already included in the WM scenario. This scenario also envisages that the EU ETS (covering power and heating plants, oil refineries and production installations in industry) will continue until 2020 with a carbon price of EUR 24–30/t, while the non-EU ETS sector (covering households, transport, waste, agriculture and services) will achieve a 10 per cent reduction in emissions.

72. The methodology used for preparing projections is well described in the NC5. Different approaches are used in different sectors. For most sectors (energy, waste, transport, industry, households and the tertiary sector) the HUNMIT model is used. HUNMIT is a modelling framework that uses a bottom-up approach to estimate the demand of useful energy (i.e. energy for lighting and heating), rather than projecting energy demand based on fuel use. Input factors to the model are the population forecast, fuel prices, demand for electricity and industrial and district heating. The model works out the most cost-effective fuel mix for the whole energy system. The HUNMIT model can assess multiple policies simultaneously, thus ensuring that abatement estimates are not double counted. For LULUCF (forestry) a carbon accounting model called CASMOFOR is used, which takes into account the afforestation rate (total area in ha/year), site fertility, and species composition (slow- versus fast-growing species). For the agriculture sector, projections are based on work undertaken by the Agricultural Economics Research Institute (AERI), which uses several models: (1) the HUSIM model for developing major macro indicators; (2) the FARM-T model to analyse structural changes in agriculture; and (3) the MICROSIM model for farm-level forecasts on the farms which could become bankrupt.

73. The ERT noted that Hungary did not summarize the strengths and weaknesses of the model or approach used in the NC5, and that the Party did not explain how the model or approach used accounts for any overlap or synergies that may exist between different PaMs. During the review, this information was provided. The ERT encourages Hungary to include this information in future national communications.

74. The NC5 presents key assumptions on GDP growth, fuel prices, power production, emission factors for electricity generation, population, waste disposal, number of kilometres travelled by passenger cars, and the thermal efficiency of fossil plants for the years 2010, 2015 and 2020 in tabular format. Assumptions on the carbon price up to the year 2020 are also given in the text. Assumed changes in the activity rate in preparing

projections are given in an appendix to the NC5 as five-year averages (2005–2010, 2010–2015, 2015–2020 and 2020–2025) for the following subcategories: different power plants in power generation and heat production; different subsectors in industry; housing stock and appliances used in households; building stock and appliances used in the tertiary sector; and waste management. Assumptions on GDP and population are similar to those in the NC4. Assumptions and, accordingly, projections, do not take into account the recent economic crisis.

75. The sensitivity of the results using different input parameters is discussed in the NC5. The main parameters that have been considered are discount rates, energy prices and CO_2 emission factors for electricity. The impact of a variation in these parameters on the projected GHG emissions is discussed in the NC5 only qualitatively and no resulting numbers/uncertainty ranges are provided. The ERT encourages Hungary to include in future national communications quantitative results of the uncertainty analysis and to add a variation in economic growth to the sensitivity study.

76. The ERT noted that Hungary did not report the main differences in the assumptions, methods employed, and results between projections in the current national communication and those in earlier national communications. During the review, Hungary stated that an entirely new modelling approach was used in the NC5 and, therefore, assumptions made in the NC4 were not directly comparable. The ERT encourages Hungary to report the main changes in assumptions, methods and results in future national communications.

2. Results of projections

77. Key results of the Party's GHG emission projections are provided in table 4 and the emission trends illustrated in the figure below. Hungary's base year emissions were fixed at 115.4 Mt CO_2 eq during the initial review. Hungary's quantified emission reduction commitment is 94 per cent. This yields a target of 108.5 Mt CO_2 eq annual emissions for the Kyoto Protocol first commitment period (2008–2012). Hungary is on track to overachieve this target by domestic efforts alone. In 2008, Hungary's total aggregated GHG emissions were 36.6 per cent below base year levels, and 32.6 per cent below the Kyoto Protocol target. The 'with measures' projections indicate that Hungary's GHG emissions will be 31.8 per cent below the Kyoto Protocol target in 2010. Activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are expected to provide further annual emission reductions and relevant removal units of 3.8 Mt CO_2 eq in 2010.

78. Under the 'with measures' scenario, between the base year and 2010, CO_2 emissions are expected to decrease by 36.2 per cent, CH_4 emissions by 17.3 per cent, N_2O emissions by 47.6 per cent, and F-gases are expected to increase by 203 per cent.

79. Beyond the first commitment period of the Kyoto Protocol, according to the 'with measures' projections, between 2005 and 2020 total CO_2 emissions will decrease by 3.8 per cent, CH_4 emissions will increase by 3.7 per cent, N_2O emissions will increase by 9.8 per cent, and F-gases are expected to increase by 15.5 per cent. Under the 'with measures' scenario, the relative contribution to the total GHG emissions (in CO_2 eq) in 2010 is 74 per cent for CO_2, decreasing to 72 per cent in 2020; 11 per cent for CH_4 in 2010, increasing to 12 per cent in 2020; 14 per cent for N_2O in 2010, increasing to 15 per cent in 2020; and 1 per cent for F-gases in 2010 and 2020.

Table 4
Summary of greenhouse gas emission projections for Hungary

	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level (%)*	*Changes in relation to 1990 level (%)*
Inventory data 1990[a]	97.37	–15.63	0.00

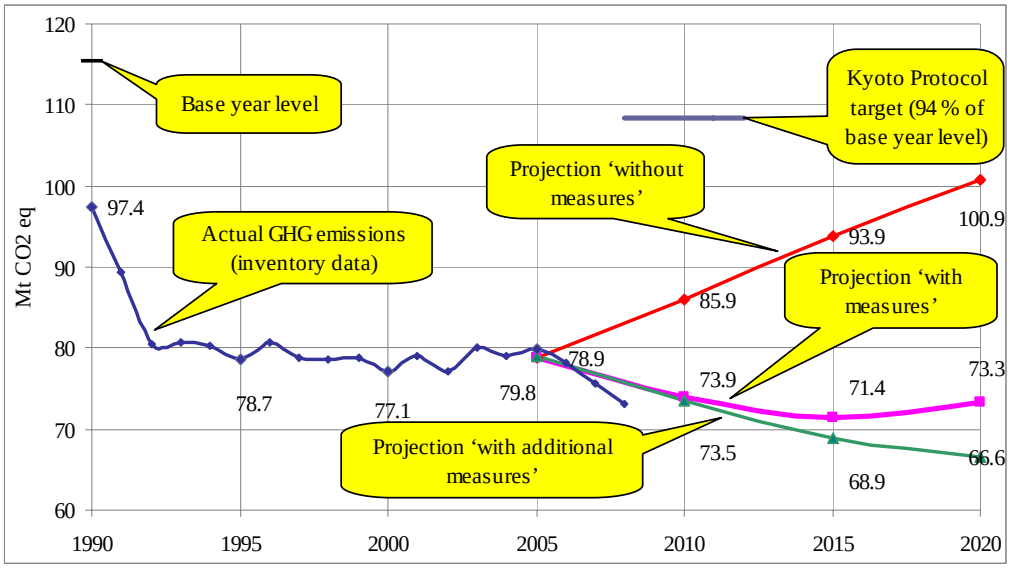
	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level (%)*	*Changes in relation to 1990 level (%)*
Inventory data 2008[a]	73.14	–36.62	–24.88
Kyoto Protocol base year[b]	115.407	0.00	18.52
Kyoto Protocol target[b]	108.47	–6.00	11.41
'Without measures' projections for 2010[c]	85.92	–25.55	–11.76
'With measures' projections for 2010[c]	73.95	–35.92	–24.05
'With additional measures' projections for 2010[c]	73.49	–36.32	–24.52
'Without measures' projections for 2020[c]	100.87	–12.59	3.59
'With measures' projections for 2020[c]	73.28	–36.50	–24.74
'With additional measures' projections for 2020[c]	66.56	–42.32	–31.64

Sources: [a] Hungary's 2010 greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).

[b] Based on the initial review report contained in document FCCC/IRR/2007/HUN.

[c] Hungary's fifth national communication.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2008: Hungary's 2010 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry (LULUCF). (2) Data for the years 2005–2020: Hungary's fifth national communication; the emissions are without LULUCF.

80. The projections presented in the NC5 were the most recent projections available at the time of the in-country review. The ERT noted that the latest projections had not been updated to take into account the effects of the recent global recession. However, the short-term impact was considered by setting activity rate changes between 2005 and 2010 to a very low level (stagnation).

81. Hungary states in its NC5 that it has a conditional objective with regard to emission reductions up to 2020, defined in the NCCS: in the case of an EU emissions reduction target of 20 per cent, Hungary would commit to a 16–25 per cent reduction by 2020, compared to 1990 levels, and if the EU emissions reduction target is 30 per cent, Hungary would commit to a 27–34 per cent reduction by 2020. Based on Hungary's 1990 emissions figures in the latest NIR of 97.4 Mt CO_2 eq, these commitments would translate to an emissions target of 73.0–81.8 Mt CO_2 eq (for an EU target of –20 per cent) or 64.3–71.1 Mt CO_2 eq (for an EU target of –30 per cent). The less ambitious commitment would be met under the current 'with measures' scenario, if all PaMs included in this scenario deliver emission reductions according to the expectations. The more ambitious commitment would be met under the 'with additional measures' scenario.

3. Total effect of policies and measures

82. In the NC5, Hungary presents the estimated and expected total effect of implemented and adopted PaMs in accordance with the 'with measures' definition, compared with a situation without such PaMs. Information is presented in terms of GHG emissions avoided or sequestered (on a CO_2 eq basis) in 2010, 2015 and 2020. It also presents relevant information on factors and activities for each sector for the years 2005–2020/2025.

83. However, the ERT noted that Hungary did not provide the following reporting elements required by the UNFCCC reporting guidelines: the estimated and expected total effect of implemented and adopted PaMs in accordance with the 'with measures' definition, compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered (on a CO_2 eq basis) in 1995 and 2000. During the review, Hungary stated that prior to 2005, no explicit climate change policies were in place. The reference scenario starts only in 2005 and, therefore, the effect of PaMs could not be provided for 1995 and 2000.

84. Hungary reported that the total estimated effect of adopted and implemented PaMs is 10.7 Mt CO_2 eq in 2010, 18.2 Mt CO_2 eq in 2015 and 24.1 Mt CO_2 eq in 2020. According to the information reported in the NC5, the RES will deliver by far the largest emission reductions, followed by the EU ETS and the NEEAP. Within the NEEAP measures, PaMs in the industrial sector will deliver the largest emission reductions, followed by measures in the tertiary and household sectors. The most effective PaMs and drivers behind GHG emission reductions are described in section II.B.1–2. Table 5 provides an overview of the total effect of PaMs as reported by Hungary.

85. Under the 'with measures' scenario, the power supply sector is the main source of emissions in 2005, contributing 27 per cent of total GHG emissions, followed by industry with 18 per cent. The contribution of the power supply sector to total GHG emissions decreases constantly until 2020, both in absolute and relative terms. In 2020, the power sector is expected to contribute 19 per cent of total emissions. In contrast, transport emissions are constantly rising, and by 2020 the transport sector will replace power supply as the largest contributor of GHG emissions, with a 22 per cent share of total GHG emissions. The relative contribution from the agriculture sector also increases constantly, from 12 per cent in 2005 to 16 per cent in 2020.

86. In absolute terms, under the 'with measures' scenario, the main reduction between 2005 and 2020 is expected to take place in the power supply sector, by 7.8 Mt CO_2 eq. Emissions in the transport sector are expected to increase in the same period by 3.6 Mt CO_2 eq, and in the agriculture sector by 2.0 Mt CO_2 eq. A reduction of 2.7 Mt CO_2 eq is expected in the industry sector between 2005 and 2020.

Table 5
Projected effects of planned, implemented and adopted policies and measures in 2010 and 2020

Sector	*Effect of implemented and adopted measures (Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect including planned measures (Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect of implemented and adopted measures (Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect including planned measures (Tg CO_2 eq)*	*Relative value (% of base year emissions)*
	2010				*2020*			
NEEAP								
household	0.30	0.26	0.38	0.33	1.34	1.16	2.27	1.97
tertiary	0.38	0.32	0.42	0.37	1.50	1.30	2.21	1.92
industrial	0.508	0.44	0.69	0.60	2.24	1.94	4.00	3.46
transport	0.088	0.07	0.13	0.12	0.36	0.31	0.77	0.67
intersectoral	0.008	0.00	0.00	0.00	0.02	0.02	0.03	0.02
NEEAP total	1.26	1.09	1.64	1.42	5.46	4.73	9.28	8.04
RES	6.71	5.81	7.38	6.39	11.39	9.87	15.228	13.19
EU ETS	2.78	2.41	2.78	2.41	4.58	5.41	6.25	5.41
Total	**10.75**	**9.31**	**11.79**	**10.22**	**21.44**	**18.58**	**30.75**	**26.65**

Source: Hungary's fifth national communication.

Abbreviations: EU ETS = European Union emissions trading scheme, NEEAP = National Energy Efficiency Action Plan, RES = Renewable Energy Strategy.

87. Hungary's NC5 gives a mostly clear and detailed description of the assumptions, methodology and results of the projections. However, the ERT notes that the NC5 does not present sector-specific information on factors and activities that would provide the reader with an understanding of emission trends and projections during the period 1990–2020. Information is given in the appendix from 2005 onwards only. The ERT recommends that Hungary provide such information in its next national communication. In addition, the ERT encourages Hungary to present the total effect of its PaMs by gas as well, and to make further improvements to the structure and accuracy of reporting in future national communications.

4. Supplementarity relating to mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

88. In its NC5, Hungary did not provide information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, or a definition of supplementarity. However, during the review process, Hungary stated that it would reach the reduction targets by domestic action alone, and is therefore not planning to use the Kyoto Protocol mechanisms to meet its targets. Hungary also provided the ERT with a list of five biomass and geothermal methane electricity generation projects supported through JI during the review. In practice, such mechanisms, in particular, JI, are used to raise funds to support Hungary's domestic climate change projects. The ERT recommends that Hungary include information on supplementarity in future national communications.

D. Vulnerability assessment, climate change impacts and adaptation measures

89. In its NC5, Hungary has provided the required information on the expected impacts of climate change in the country and on adaptation options. Regional climate scenarios, using the REMO, NCAR RegCM and ALADIN-Climate models, for the Carpathian Basin were provided for the years 2021–2040. The scenarios point to: a significant rise in temperature in all seasons; a decrease in the number of frost days; an increase in the number of days with heat alert; and an insignificant change in annual and seasonal precipitation. In June 2003, the Ministry for Environment and Water (KvVM) and the Hungarian Academy of Sciences (MTA) launched a joint research project entitled "Global climate changes, Hungarian impacts and responses", which recently became known as the VAHAVA project. Based on the modelling studies and activities as part of this project, Hungary's climate change impacts can generally be described as moderate, with an increasing probability of more severe impacts due to climate change. Agriculture, forestry and human health are the sectors most likely to be affected. Hungary's NCCS 2008–2025 sets out the Party's long-term climate change policy direction. Adaptation is recognized as a key pillar of the policy, which will see its prominence increased in the revised NCCS due in 2011. However, the ERT noted that Hungary did not provide an outline of the action taken to implement Article 4, paragraph 1(e), of the Convention with regard to cooperation on adaptation. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

Table 6
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture and food security	*Vulnerability:* The vulnerability of the agriculture sector is estimated to be high
	Adaptation: The use of appropriate land use and cultivation, irrigation and relevant technologies are possible adaptation measures. Studies of the relationship between climatic variables and species and the agronomic characteristics of crops will underpin adaptation measures
Biodiversity and natural ecosystems	*Vulnerability:* Natural habitats and biodiversity are likely to be negatively impacted. The availability of water was recognized as a key driver. The social and economic services rely on healthy ecosystems
	Adaptation: More data and studies are needed to estimate specific climate change impacts on horticulture and other ecosystems
Drought	*Vulnerability:* The modelling results point to extremes of rainfall, with reduced amounts in some regions
	Adaptation: The use of technologies in specific sectors are possible adaptation measures
Forests	*Vulnerability:* Forests are also recognized as being vulnerable to water availability and temperature
	Adaptation: The use of technology and further studies on the behaviour of species in response to changes in climatic variables are suggested
Human health	*Vulnerability:* An increase in temperature would lead to an increase in the number of days with heat alert. This has implications on human health, especially among Hungary's ageing population
	Adaptation: No specific measures are mentioned
Infrastructure and economy	*Vulnerability:* This is recognized as a major security issue
	Adaptation: The need for further assessment of the effects of climate change on key infrastructure, such as roads, drainage and storage

Vulnerable area	*Examples/comments/adaptation measures reported*
	facilities, is recognized. The ability to respond to these challenges, through a risk-based approach, needs to be strengthened
Water resources	*Vulnerability:* This is a key sector that is vulnerable to the extreme situations of excess and reduced water availability as well as quality. It would affect many sectors, such as agriculture, forestry, health and ecosystems
	Adaptation: The assessment and monitoring of water reserves, policies on water usage and flood control are possible adaptation measures

90. The key vulnerabilities due to climate change for Hungary are attributed to water resource management. Increased surface temperature and heat and a decrease in precipitation would have a direct impact on hydrology, leading to reduced water availability and the drying of soils. At the other extreme, increased frequency and intensity of precipitation can lead to floods, the inundation of low-lying areas and hydromorphological changes. The ERT noted that there is no mention of the tools and methodologies used in the vulnerability assessment. Further, the ERT observed that much of the vulnerability highlighted in various sectors is based on anticipated impacts derived from IPCC scenarios. The NC5 did not demonstrate any rigorous assessments specific to Hungary; most information was adopted for the local situation. However, the VAHAVA study contained more specific examples which could have been included in the NC5. The ERT encourages Hungary to include such targeted information in future national communications.

91. The NC5 recognizes the critical role of adaptation on a timely basis and examines the climate–security nexus in the critical areas of ecosystems, agriculture and forest management, infrastructure and water management. Particular issues arising out of the urban heat problem (i.e. the heat effect due to urbanization) are highlighted, given that Hungary's urban population is forecast to rise to 80 per cent of the total population in a few years. The importance of adaptation in the above areas is described and possible adaptation measures to deal with the likely impacts of climate change are outlined. The ERT noted that many of the adaptation measures are generic responses to impacts as contained in the literature. There is scope for more targeted, localized responses, which the Party is encouraged to include in its future national communications.

92. Hungary has not provided information on cooperation with developing countries in preparing for adaptation in its NC5, primarily because of its current emphasis on the domestic effort. According to Hungary, its proposed contribution to the 'fast-start' fund would provide a mechanism for financial and technical assistance to developing country Parties. The ERT recommends that Hungary provide such information in its future national communications.

93. The ERT noted that vulnerability and impacts need to be based on solid scientific analysis and assessment. These in turn should form the basis of priority adaptation strategies and measures. The ERT encourages Hungary to improve the linkages between the sections reporting on the scenarios, vulnerability and adaptation in its future national communications.

E. Research and systematic observation

94. Hungary has provided information on its actions relating to research and systematic observation, mainly in relation to domestic activities. There is, however, a lack of detail on international activities, including the World Climate Programme, the International Geosphere–Biosphere Programme (IGBP), the GCOS and the IPCC. Hungary has not

provided a summary of information on World Meteorological Organization (WMO) programmes and subprogrammes such as World Weather Watch (WWW), Global Atmosphere Watch (AW), Global Observation System (GOS), GCOS, Global Ocean Observation System (GOOS) and Global Terrestrial Observing System (GTOS) activities. In addition, the NC5 does not reflect the action taken to support related capacity-building in developing countries. The ERT noted the lack of information in Hungary's NC5 on the observational networks, data management, QC and data exchange. While this information was provided by the Hungarian Meteorological Service during the review, the ERT recommends that Hungary include this information explicitly in its future national communications. The ERT further noted that, following the completion of the VAHAVA project, the coordination and implementation of climate change research in Hungary will have been greatly enhanced.

95. The ERT noted that the VAHAVA project, carried out by the Hungarian Academy of Sciences, provides the scientific and technical basis for the NCCS. The NCCP outlines a comprehensive list of research activities, including collaboration at the EU and international levels. The modelling work is carried out as a joint activity between the Hungarian Meteorological Service and the Department of Meteorology at Eotvos Lorand University. The international research activities are currently limited to EU countries, and Hungary has not reported on any other international research collaboration.

96. Funding for climate change research stems mainly from EU sources, as part of the cooperation programme under the 7th Research Framework Programme. The National Office for Research and Technology also provides funds for climate change research under the Liveable and Sustainable Environment, and the Defence and Security Research subprogrammes. The national research efforts appear to be well coordinated and supported through the active participation of the Hungarian Academy of Sciences, the Hungarian Meteorological Service and national universities and research institutions. As part of the VAHAVA project, the periodical *AGRO-21* has been developed, consisting of 18 volumes focusing on climate change and the required responses, and covering almost all the main economic and social sectors, such as nature conservation, water management, agriculture, forestry, rural development, transport, energy, environmental health, settlements and insurance. The largest positive result of this research project has been raising the awareness of the public to the importance of preparing for the adaptation to and mitigation of climate change and its impacts. However, Hungary has not reported on any initiatives to support capacity-building or research and development in developing countries.

97. The bulk of the observational activities are carried out by the Hungarian Meteorological Service and the Department of Meteorology at Eotvos Lorand University. Hungary, as a member of the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), participates in satellite observation networks. Hungarian institutions have also participated in several international research efforts on carbon balance projects such as CarboEurope-IP, Carbon-Pro and COST Action 725. Hungary was also part of the Adam Project 2006–09, implemented by the University of East Anglia (United Kingdom of Great Britain and Northern Ireland) involving around 19 countries undertaking adaptation and mitigation projects.

F. Education, training and public awareness

98. In the NC5, Hungary has provided information on its actions relating to education, training and public awareness at three levels of action: environmental education; publicly available environmental education; and strengthening the role of the media in raising awareness. A comprehensive list of courses and programmes offered by Hungarian colleges and universities is provided in the NC5, which underlines the diversity of climate change

related studies; collaborative programmes with institutions in Greece, Sweden and the United Kingdom have been set up.

99. The NC5 outlined the governmental support for education programmes and training related to climate change. Various organizations and professional bodies such as the Energy Centre, the Hungarian Green Building Council and KOVET (the Association for Sustainable Economies) carry out regular workshops and conferences on climate change and sustainable development. In its NC5, Hungary has not reported on any joint training programmes or capacity-building activities with developing countries. The ERT encourages Hungary to include such information in future national communications.

100. A large and diverse range of activities to raise public awareness are highlighted in the NC5. These have been actively supported by non-governmental organizations (NGOs), churches and business councils. The Hungarian Government organized a Climate Road Show in 2008 aimed at raising awareness of climate change throughout the country. A government-administered website – Liveable Environment[5] – is also dedicated to raising public awareness. Hungary used the opportunity provided through the EU-funded You Control Climate Change campaign to raise awareness about global climate change. International NGOs, such as Greenpeace and the World Wildlife Fund (WWF), have been active at global forums such as the Road to Copenhagen, and Earth Hour. Civil society in Hungary appears to be well organized and supported in its public awareness and advocacy campaigns. A survey conducted by the NGOs showed a high level of public awareness of climate change issues, although the behavioural change activities at the domestic level are often dictated by economic considerations.

G. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

101. Hungary has provided some supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC5. The supplementary information is placed in different sections of the NC5. Table 7 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC5 chapters in which this information is provided.

102. Hungary has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol; the identification of steps taken to promote and/or implement any decisions by the International Civil Aviation Organization and the International Maritime Organization in order to limit or to reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels; and information on what efforts Hungary is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. Most of these information were provided to the ERT during the review. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report. The ERT recommends that Hungary include these reporting elements in its next national communication.

[5] See <http://www.elhetokornyezet.hu/>.

Table 7
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference*
National registry	Chapter 3.4
National system	Chapter 3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Not reported
Policies and measures in accordance with Article 2	Chapter 4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapter 4.2
Information under Article 10[a]	Not reported
Financial resources[a]	Not reported

[a] As a country with an economy in transition, Hungary does not have to report on the implementation of Articles 10 and 11 of the Kyoto Protocol, including on the provision of new and additional resources.

H. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

103. Hungary reported the information requested in section H., Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the annex to decision 15/CMP.1 as a part of its 2010 annual submission. It has not reported, however, how it gives priority to the actions taken in implementing its commitments under Article 3, paragraph 14. During the in-country review, Hungary provided the ERT with additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be complete but minimal. The ERT notes that Hungary provided additional information during the review and encourages it to continue exploring and reporting on the adverse impacts of the response measures.

104. The NIR 2010 and the additional information provided during the review presented several initiatives of Hungary aiming to minimize adverse impacts, including: Hungary's commitment of EUR 6 million to developing countries as part of the 'fast-start' package announced at the United Nations Climate Change Conference in Copenhagen. A total of EUR 1 million has been committed for 2010 for the LDCF, EUR 2 million has been committed for 2011 and the balance of EUR 3 million has been committed for 2012. The Ministry for Foreign Affairs is developing a long-term ODA strategy for climate change. As gas and oil purchases are mostly sourced from the Russian Federation, Hungary's climate change policies should have a low impact on oil-exporting developing countries. In addition, Hungary strives to ensure that feedstock for biofuels is locally sourced so as to avoid contributing to food shortages in developing countries.

III. Conclusions and recommendations

105. The ERT concludes that the NC5 generally provides an overview of the national climate policy of Hungary. The information provided in the NC5 includes most of the mandatory information required by the UNFCCC reporting guidelines, and some elements

of the supplementary information required under Article 7 of the Kyoto Protocol, with the exception of information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, information on PaMs to reduce emissions from aviation and marine bunkers, and information under Article 10 of the Kyoto Protocol. During the review, Hungary provided the ERT with additional information on the JI projects, international bunkers, and activities under the GCOS programme.

106. Hungary's emissions for 2008 were estimated to be 36.1 per cent below its base year level excluding LULUCF and 38.9 per cent below including LULUCF. Emissions decreases were driven by a downturn in the economy, fuel switching to less carbon-intensive fuels and a restructuring of the economy.

107. In the NC5, Hungary presents GHG projections for the years 2010, 2015 and 2020, using 2005 as the starting point for the projections. Three scenarios are included: the baseline ('without measures') scenario; the 'with measures' scenario (called 'with existing measures' in the NC5); and the 'with additional measures' scenario. The projected reductions in GHG emissions under the baseline scenario, in relation to the base year, and under the 'with measures' and 'with additional measures' scenarios, are 25.6, 35.9 and 36.3 per cent, respectively, for 2010. Thus, the projections indicate that Hungary can meet its Kyoto Protocol target (which is a 6 per cent reduction), even under the baseline scenario with the domestic policies currently in place. Moreover, GHG emissions are not expected to exceed the Kyoto Protocol target even by 2020.

108. The NC5 contains no information on how the use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. However, Hungary provided relevant information during the review and explained that it is not planning to make use of the Kyoto Protocol mechanisms to meet its first commitment period Kyoto target and, hence, is expected to meet the supplementarity requirements.

109. The National Climate Change Strategy 2008–2025 and the promotion of energy efficiency and renewable energy are among the most important PaMs in reducing GHG emissions. The benefits of the energy efficiency PaMs in Hungary appear to be high relative to the cost and could possibly occur under a 'business as usual' scenario. It is therefore important for Hungary to continue to re-evaluate the energy efficiency measures in place in order to ensure that the improvements would be additional to what could occur under 'business as usual', given that the benefits of the scheme are likely to diminish over time as the energy efficiency of the housing stock is improved.

110. Mitigating emissions from transport is the most challenging part of the overall mitigation strategy for Hungary. Under the PaMs currently in place, Hungary expects to reduce transport emissions by only 7 per cent between 2005 and 2020. Additional PaMs need to be put in place in order to reach the national target of at least a 10 per cent reduction in emissions from the transport sector. Further, options to support measures to achieve the renewable energy supply target in Hungary of 13 per cent by 2020 need to be explored, given that no PaMs have yet been implemented to meet this target. The introduction of more stringent emission standards and the EU-wide regulation on decreasing the GHG emissions (caps) of a producer's car fleet will help to close the gap.

111. The key vulnerabilities are attributed to water resource management, which will be impacted by extremes of precipitation and temperature increase. Climate change impacts are expected to be visible in other sectors as well, including agriculture, forestry, biodiversity and health. Various adaptation measures are explored as potential responses to these impacts.

112. Hungary has provided information on its actions relating to research and systematic observation, and has effectively addressed its domestic activities. There are references to its international activities, including the World Climate Programme, the IGBP, the GCOS and

the IPCC. The ERT noted that Hungary contributes effectively to EU observation efforts and participates in a number of carbon monitoring projects. There is a growing emphasis on research activities on climate change and its impacts under the guidance of the Hungarian Academy of Sciences and various universities. There is also a substantial emphasis on integrating climate change education into formal programmes at the primary, secondary and tertiary levels.

113. The ERT concluded that Hungary's national system continues to perform its required functions as set out in decision 19/CMP.1; that the national registry continues to perform the functions set out in decision 13/CMP.1 and decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions. The ERT noted that updates of databases and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible persons.

114. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol provided by Hungary in its 2010 annual submission is limited. The ERT encourages Hungary to further enhance the reporting on Article 3, paragraph 14, including by indicating how it gives priority to the actions taken in implementing its commitments under Article 3, paragraph 14.

115. In the course of the IDR, the ERT formulated several recommendations relating to the completeness and transparency of Hungary's reporting under the Convention and its Kyoto Protocol. The key recommendations[6] are that Hungary include, in the next national communication, information on:

(a) The effects of PaMs on GHG emissions for all sectors and gases, especially for the agriculture, waste and industrial processes sectors in future national communications;

(b) The steps undertaken to limit or reduce GHG emissions from aviation and marine bunkers;

(c) The use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol and their supplementarity to domestic action.

116. The ERT encourages Hungary to undertake a number of improvements regarding transparency and completeness of reporting; the most important of these are that the Party:

(a) Provide a clearer link throughout the national communication between national circumstances, the GHG emissions profile and emission trends, and PaMs;

(b) Provide more detail on the climate change governance structure and explain how PaMs are implemented by municipal governments, in particular how central government can affect climate policies at the municipality levels given that municipalities have competencies over policy issues at those levels;

(c) Provide more detailed information on how EU-directed policies are implemented in Hungary and their impact on emissions;

(d) Provide a best estimate of the projected effects of the EU ETS in the PaMs chapter, and explain any overlap with existing PaMs;

(e) Provide information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol;

[6] The recommendations are given in full in the relevant sections of this report.

(f) Provide further information on its activities in the area of research, and data gathering, in particular on the collaboration with developing countries and other international agencies/organizations;

(g) Provide further information on international activities relating to systematic observations, including GCOS activities;

(h) Enhance the linkages between the sections on research, modelling, vulnerability assessments and adaptation measures;

(i) Provide further information on the minimization of adverse effects and impacts in accordance with Article 2, paragraph 3, and Article 3, paragraph 14, of the Kyoto Protocol.

IV. Questions of implementation

117. During the review, the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness and transparency. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06.pdf>.

FCCC/SBI/2007/INF.6/Add.1. Compilation and synthesis of NC4s, Add.1: Policies, measures, past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06a01.pdf>.

FCCC/SBI/2007/INF.6/Add.2. Compilation and synthesis of NC4s, Add.2: Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06a02.pdf>.

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FCCC/ARR/2009/HUN. Report of the individual review of the greenhouse gas inventory of Hungary submitted in 2009. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

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Fourth national communication of Hungary. Available at <http://unfccc.int/resource/docs/natc/hunnc4.pdf>.

2009 GHG inventory submission of Hungary. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

2010 GHG inventory submission of Hungary. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

VAHAVA project (Change (VÁltozás) Impact (HAtás) Response (VÁlasz) – Joint scientific cooperation of the Hungarian Ministry for the Environment and Water (KvVM) and the Hungarian Academy of Sciences (MTA), 2003–2006.

National Climate Change Strategy (NCCS), 2008–2025, Ministry for the Environment and Water and the Hungarian Academy of Sciences.

ADAM project 2006–2009, an FW-6 research project involving 19 countries, organized by the University of East Anglia, United Kingdom.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Kinga Szabó (Ministry of National Economy of Hungary), including additional material on updated PaMs, GHG projections, the national registry and recent climate policy developments in Hungary. The following documents[1] were also provided by Hungary:

Ministry of Agriculture and Rural Development, 2007, *New Hungary Rural Development Strategic Plan (2007–2013)* Budapest. 2007.

Ministry of Agriculture and Rural Development, 2008, *New Hungary Rural Development Programme Budapest, December, 2008. Amended version. Amendments approved by the Monitoring Committee in year 2008*, Budapest. 2008.

[1] Reproduced as received from the Party.