COMPLIANCE COMMITTEE

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2 October 2007

Report of the review of the initial report of Slovakia

Note by the secretariat

The report of the review of the initial report of Slovakia was published on 19 September 2007. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2), the report is considered received by the secretariat on the same date. This report, FCCC/IRR/2007/SVK, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the review of the initial report of Slovakia

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

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I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Slovakia, coordinated by the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 19 to 24 March 2007 in Bratislava, Slovakia, and was conducted by the following team of nominated experts from the roster of experts: generalist – Ms. Riitta Pipatti (Finland); energy – Mr. Takeshi Enoki (Japan); industrial processes – Mr. Stanford Mwakasonda (South Africa); agriculture – Mr. Mahmoud Medany (Egypt); land use, land-use change and forestry (LULUCF) – Ms. Kimberly Robertson (New Zealand); waste – Ms. Irina Yesserkepova (Kazakhstan). Mr. Stanford Mwakasonda and Ms. Riitta Pipatti were the lead reviewers. In addition the expert review team (ERT) reviewed the national system, the national registry, and the calculations of the Party's assigned amount and commitment period reserve (CPR), and took note of the LULUCF parameters. The review was coordinated by Mr. Harald Diaz-Bone and Mr. Matthew Dudley (UNFCCC secretariat).

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

B. Summary

1. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial report prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report was submitted on 4 October 2006, which is in compliance with decision 13/CMP.1. In its initial report Slovakia refers to its 2006 greenhouse gas (GHG) inventory submission of 13 April 2006. However, the national inventory report (NIR) was submitted to the UNFCCC only on 26 June 2006. Prior to the in-country visit Slovakia submitted a revised GHG inventory on 16 January 2007 which was used as the basis for the review by the ERT. The Party officially resubmitted its GHG inventory on 21 June 2007 in response to questions raised by the ERT during the course of the in-country visit. The initial report, the NIR and the revised CRF tables are considered in this review report.

2. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report and reflects any revised estimates provided by the Party resulting from the review process. These revisions are based on revised estimates for GHG emissions from categories 1.A Energy – Stationary Combustion (see para. 62), 1.A.3 Transport (see paras. 58 and 59), 1.B Fugitive Emissions (see para. 67), 2.B.2 Nitric Acid Production (see para. 76), 4.A Enteric Fermentation (see para. 89), and 4.D Agricultural Soils (see para. 87), which changed the estimate for total GHG emissions in the base year, from 73,360.10 Gg carbon dioxide (CO_2) equivalent, as originally reported by the Party, to 72,050.76Gg CO_2 equivalent.

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

Item	Provided	Value/year/comment
Complete GHG inventory from the base year 1990 to the most recent year available, 2004	Yes	Base year: 1990 The CRF tables and the NIR do not contain a full set of data for 1991–1999. This is addressed in more detail below in this section as well as in the sector sections.
Base year for HFCs, PFCs and SF_6	Yes	1990
Agreement under Article 4	No	Not applicable
LULUCF parameters	Yes	Minimum tree crown cover: 20% Minimum land area: 0.3 ha Minimum tree height: 5 m in situ
Election of and accounting period for Article 3, paragraphs 3 and 4, activities for the first commitment period	Yes	Slovakia has elected not to account for activities under Article 3, paragraph 4. Slovakia has elected to account for each activity under Article 3, paragraph 3, (afforestation, reforestation and deforestation) for the entire commitment period.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	337 456 459 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised value		331 433 516 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	255 230 824 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised value		242 974 886 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	A complementary description was provided during the review in response to recommendations from the ERT.
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	Some details demonstrating that the national registry conforms with the data exchange standards (DES) were not provided

5. Slovakia has provided a description of its national system in its initial report, complemented by the information given in the NIR. According to these descriptions, at the time the initial report was compiled, Slovakia was still in the process of establishing its national system and had not yet finalized the legal and institutional arrangements. In response to recommendations by the ERT, Slovakia formalized the arrangements of its national system, and provided the ERT with a revised description of the system during the review process.

6. According to the initial report, Slovakia had not yet elaborated a quality assurance/quality control (QA/QC) plan as part of the annual inventory planning. During the in-country review, the ERT was informed that a QA/QC plan was under preparation, and the revised description of the national system referred to in paragraph 5 included a description of the QA/QC plan in Slovakia. The ERT found this plan still vague and recommends that Slovakia further develops it and implements the QA/QC measures in accordance with the UNFCCC guidelines for national systems and the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance), and describes the progress it has made in its next NIR.

7. Slovakia has provided a full set of CRF tables for the years 1990–2004. However, the ERT noted that the CRF tables for the years 1991–1999 did not provide complete disaggregated emission estimates and background tables for the energy sector and other sectors. The data gaps in the CRF tables, in particular in the background tables, vary from sector to sector and are described in more detail in the sector sections of this report below. Furthermore, the ERT noted that the structure and contents of the NIR are not fully consistent with the UNFCCC Guidelines for the preparation of national

communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories (hereinafter referred to as the UNFCCC reporting guidelines). In particular, the information on cross-cutting issues such as source-specific QA/QC, verification, recalculations and planned improvements, as well as information on the basis for the uncertainty estimates and key categories, is insufficient. The ERT recommends that Slovakia complement the CRF tables with the missing data, and revise the structure and contents of its NIR in line with the UNFCCC reporting guidelines.

8. The information in the initial report as complemented with the revised description of the national system generally covers the elements required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties serving as the Meeting of the Parties (CMP), except that (a) some details demonstrating that the national registry conforms with the data exchange standards (DES) are missing, (b) the QA/QC plan is not developed and implemented in accordance with the IPCC good practice guidance (see para. 6 above) and (c) there are data gaps in the CRF and the NIR, as noted in paragraph 7 above.

3. Transparency

9. The initial report is generally transparent, with the exception of the NIR. During the review the ERT identified the following areas where transparency needs to be further enhanced:

(a) The description of methodologies needs to be more detailed and should include all the elements stipulated by the IPCC good practice guidance and the UNFCCC reporting guidelines, especially for country-specific methods;

(b) The NIR should include the QA/QC plan and information on the QA/QC measures implemented in all sectors;

(c) The rationale and justification for all recalculations should be provided;

(d) The NIR should be structured in accordance with the annex to the UNFCCC reporting guidelines.

10. During the in-country review, national experts involved in inventory preparation presented the ERT with further details and information on the methodologies used for estimating GHG emissions and removals in Slovakia. They also provided the ERT with additional information on the collection of activity data (AD) and the choice of emission factors (EFs). The presentations, the material received and the bilateral discussions with the experts helped to clarify most instances where transparency is lacking in the NIR. Reiterating the recommendations from previous inventory reviews, the ERT urges Slovakia to improve and expand the descriptions of methodologies in the NIR in accordance with the UNFCCC reporting guidelines in its next inventory submission. In particular, country-specific methodologies used for key categories should be explained in detail, and when models are used in the calculation of the estimates, key assumptions and parameters should be described in the NIR. The significant decreases in annual emissions since the base year (1990), especially in the energy and agriculture sectors, need explanation. The collection of AD should be described and time series for AD should be given in the NIR. The sector sections of this report below give additional examples of areas where transparency needs to be improved.

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

11. In the base year (1990 for all GHGs), the most important GHG in Slovakia was carbon dioxide (CO_2), contributing 83.6 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by methane (CH_4), 7.5 per cent, and nitrous oxide (N_2O), 8.6 per cent, see figure 1. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 0.4 per cent of overall GHG emissions in the base year. The energy sector accounted for 81.3 per cent of total GHG emissions in the base year, followed by agriculture (9.8 per cent), industrial processes (6.8 per cent) and waste (2.1 per cent): see figure 2. Total GHG emissions (excluding LULUCF) amounted to 72,050.76 Gg CO_2 equivalent in 1990 and decreased by 32.6 per cent between the base year and 2004. The ERT noted that a number of factors influenced the considerable decline in total GHG emissions in Slovakia; in particular, the process of transition to a market economy caused significant economic and structural changes during the early 1990s, especially in the energy and agriculture sectors.

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

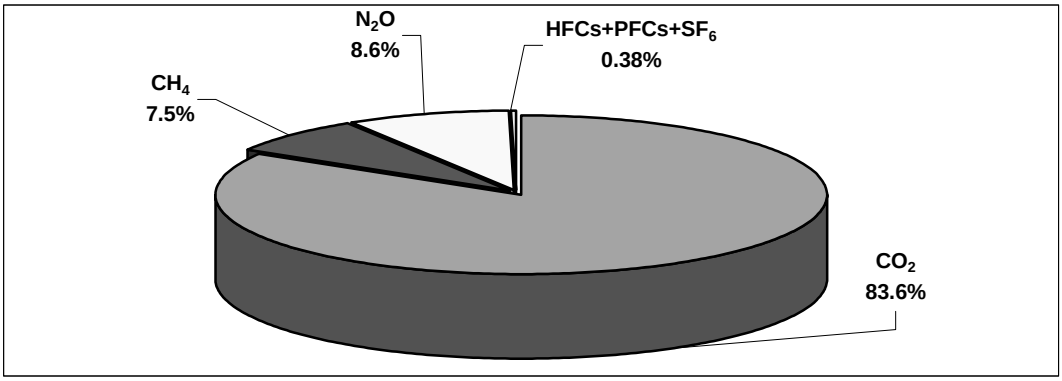
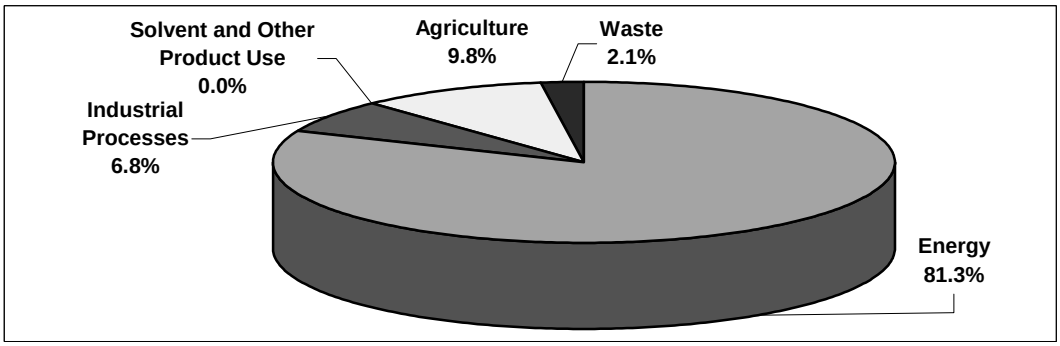


Figure 2. Shares of sectors in total GHG emissions, base year



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

13. Slovakia's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol.

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

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

GHG emissions (without LULUCF)	Gg CO_2 equivalent								Change
	Base year[a]	1990	1995	2000	2001	2002	2003	2004[a]	BY–2004 (%)
CO_2	60 221.70	60 221.70	43 715.62	39 382.34	42 293.76	40 347.61	40 645.11	40 243.72	–33.2
CH_4	5 392.68	5 392.68	4 620.30	4 463.95	4 532.89	4 591.09	4 559.79	4 351.48	–19.3
N_2O	6 164.98	6 164.98	4 065.87	3 500.84	3 706.53	3 670.47	3 706.82	3 809.55	–38.2
HFCs	0.00	0.00	22.15	75.78	82.80	103.10	133.16	154.43	NA
PFCs	271.37	271.37	114.32	11.65	15.59	13.75	21.65	19.91	–92.7
SF_6	0.03	0.03	9.91	13.25	13.84	14.78	15.39	15.89	51 834.4

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

[a] Slovakia submitted revised estimates for the base year and 2004 in the course of the initial review on 21 June 2007. These estimates differ from Slovakia's GHG inventory submitted in 2006.

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

Sectors	Gg CO_2 equivalent								Change
	Base year[a]	1990	1995	2000	2001	2002	2003	2004[a]	BY–2004 (%)
Energy	58 590.62	58 590.62	42 601.10	37 815.74	40 640.76	38 551.11	39 026.48	37 808.38	–35.5
Industrial processes	4 922.77	4 922.77	4 050.76	4 235.13	4 478.01	4 427.39	4 364.90	5 285.85	7.4
Solvent and other product use	NE, NO	NE.NO	NE.NO	10.60	29.53	56.89	58.85	79.92	NA
Agriculture	7 035.53	7 035.53	4 388.57	3 482.13	3 530.18	3 547.31	3 411.52	3 226.78	–54.1
LULUCF	NA	–2 388.50	–2 684.09	–2 386.20	–5 207.77	–5 225.91	–4 814.73	–4 230.16	NA
Waste	1 501.85	1 501.85	1 507.74	1 904.22	1 966.93	2 158.09	2 220.17	2 194.05	46.1
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	69,662.27	49,864.08	45,061.62	45,437.64	43,514.88	44,267.19	44,364.82	NA
Total (without LULUCF)	72 050.76	72 050.76	52 548.18	47 447.82	50 645.41	48 740.79	49 081.91	48 594.98	–32.6

Note: BY = Base year; LULUCF = Land use, land-use change and forestry; NE = Not estimated; NO = Not occurring; NA = Not applicable.

[a] Slovakia submitted revised estimates for the base year and 2004 in the course of the initial review on 21 June 2007. These estimates differ from Slovakia's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

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

14. Slovakia's national system has generally been prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). However, the QA/QC plan has not been developed and implemented in accordance with the IPCC good practice guidance (see para. 6 above), there are data gaps in the CRF tables (see para. 7 above), and the transparency of the NIR is insufficient (see para. 10 above).

15. The Slovak Hydrometeorological Institute (SHMI) has been assigned as the single national entity with overall responsibility for the national inventory. The Act on Air (Act 478/2002) gives the SHMI the responsibility of acting as the single national entity for emissions inventories in Slovakia. The ERT noted, however, that this act defines responsibilities for air quality issues, and does not explicitly refer to GHG emissions. In accordance with the Resolution of the Government of the Slovak Republic (No. 1370), the Ministry of the Environment and the SHMI sign annual contracts on the preparation of the emission inventories, including the national GHG inventory.

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

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

* Mandatory elements of the national system.

16. The ERT noted that Slovakia has not implemented all the specific functions relating to inventory planning, preparation and management as stipulated by the guidelines for national systems. In particular, QA/QC measures have not been implemented in accordance with a plan that follows the IPCC good practice guidance. However, during the review, the ERT was informed that some QA/QC measures have been implemented. For example, activity data for major sources have been compared with the national

statistics and previously submitted data; for some categories alternative methods have been used for comparison, and to verify emission estimates; and Slovakia and the Czech Republic have collaborated in the inventory preparation process by reviewing and commenting on each other's inventory results (external review). The ERT welcomes these QA/QC measures. However, it also gained the impression that many of the deficiencies in the national GHG inventory could have been overcome if QA/QC measures had been implemented in a systematic way throughout the inventory preparation.

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

1. Institutional, legal and procedural arrangements

18. During the in-country review, host country officials explained the institutional arrangements, as part of the national system, for the preparation of the GHG emissions inventory. The information received during the review visit was also complemented with the more detailed information given in the revised description of the national system. The SHMI is the single national entity. The Department of Air Quality of the SHMI is responsible for the coordination and compilation of the inventory. The Ministry of the Environment is the UNFCCC focal point with overall responsibility for inventory submission. Other agencies, organizations and consultants are also involved in the preparation of the inventory. The Statistics Office, the Customs Directorate and the Air Quality Department of the SHMI collect and publish the annual activity data needed in preparing the inventory. Slovak Technical University (STU) in Bratislava produces the emission estimates of the industrial processes and solvent and other product use sectors; the Slovak Association for Cooling and Air Conditioning Technique in Rovinka produces the estimates for the F-gases, and the Slovak Agricultural University produces the estimates for the agriculture sector. Specialized research institutes prepare the inventories for LULUCF and transport; and different consultancies produce the estimates for the energy and waste sectors and for transport, and the STU Faculty of Mathematics, Physics and Informatics facilitates the preparation of the uncertainty analysis of emission estimates. Finally, a cross-sectoral working group on climate change checks, comments on and approves all important outputs in the area of climate change, including the national communications and inventories.

19. The specific responsibilities of the entities participating in the inventory preparation are defined and allocated by means of annual contracts with the SHMI. Before a contract is signed, tasks and specific needs for the preparation of estimates for the relevant inventory year are discussed. The ERT noted that the entities in charge of producing the emission estimates do not participate in compiling the CRF tables or in documenting methodologies in the NIR. The ERT encourages Slovakia to involve the participating organizations and consultants in this phase as well, in order to improve the quality and consistency of the descriptions of methodologies as well as the overall quality of the inventory. The ERT also encourages Slovakia to secure the institutional arrangements on a longer-term basis, for example, by means of framework agreements or memoranda of understanding between the SHMI and the participating entities.

20. There is an established process for the official consideration and approval of the GHG emissions inventory, including recalculations, prior to its submission and for responding to any issues raised by the ERT. The Ministry of the Environment is responsible for the submission of the inventory, which is prepared by the SHMI and approved by the cross-sectoral working group.

21. The Ministry of the Environment is also responsible for the national coordination of official responses to external inventory reviews. During the in-country review, it was the Ministry of the Environment that provided the ERT with responses from national experts to questions raised by the ERT.

2. Quality assurance/quality control

22. According to the revised description of the national system, Slovakia has elaborated a QA/QC plan. However, the ERT noted that the plan is still vague and needs to be more detailed if it is to comply fully with the IPCC good practice guidance. The ERT recommends that Slovakia develop the plan further and provide a comprehensive QA/QC plan in its next NIR. Slovakia has implemented individual QA/QC measures in most sectors. The activity data used in the inventory are compared with data from other sources. Most AD in the energy and industrial processes sectors are based on plant-specific data which are checked by the authorities (district offices) before being entered into the National Emissions Inventory System (NEIS), the database on stationary sources of emissions which is used in inventory preparation as one of the main sources of AD. The data in the system are also compared against the national statistics. The ERT noted that for some source categories no specific QA/QC measures are described.

23. Slovakia and the Czech Republic collaborate continuously in reviewing each other's GHG emission inventories. However, the details of this collaboration are not described in the NIR. The ERT recommends that Slovakia provide in its next NIR more information on how this external review is carried out and how the results are used in the inventory preparation process.

3. Inventory management

24. Slovakia has a centralized archiving system. The inventory submissions and material related to the preparation of the annual inventory are archived at the SHMI. The archiving includes inventory submissions and reports produced by the participating organizations on the annual inventory preparation, as well as some calculation sheets and results of model runs done during the preparation of the inventory. The material is archived electronically on the laptop computer of the inventory compiler. Some parts of the material (submission, reports by the participating organizations) are also archived as paper copies. The ERT was informed that the annual inventory submissions are also archived at the Ministry of the Environment. The ERT recommends that Slovakia improve the archiving system to ensure a more comprehensive (including the sectoral calculations and metadata) and secure system. The ERT also recommends that Slovakia provide a description of the system in its next NIR. In its response to the draft version of this report Slovakia reported that is has developed a new software tool to archive all relevant documents and calculation files directly in an electronic database. Also, official reported inventory data and GHG emission projections are published on the web using this tool: www.ghg-inventory.gov.sk. The ERT welcomes the progress, but notes that it was able to review only the public part of the system.

B. Greenhouse gas inventory

25. In conjunction with its initial report, Slovakia has submitted CRF tables for the years 1990–2004 and an NIR. Prior to the in-country visit Slovakia submitted a revised GHG inventory on 16 January 2007 which was used as the basis for the review by the ERT. The Party officially resubmitted its GHG inventory on 21 June 2007 in response to questions raised by the ERT during the course of the in-country visit. The inventory data include information on total emissions by sector and gas for all inventory years, but the ERT noted that for some individual categories data have been aggregated to higher-category levels, or the notation key "not estimated" ("NE") has been used in the CRF tables and in the NIR. Instances (see the sector sections of this report below) were identified especially for the inventory years 1991–1999.

26. During the in-country review, Slovakia provided the ERT with additional information sources. The additional information was provided in the form of presentations, calculation sheets used in the inventory preparation, and specific reports on methods, activity data and emission factors. In addition, Slovakia provided written and oral responses to questions and requests raised by the ERT. The full list of materials used during the review is provided in the annex to this report.

1. Key categories

27. Slovakia has reported a key category tier 1 analysis, both level and trend assessment, for the inventory year 2004, but not for the base year, as part of its initial report submission. The NIR does not state whether Slovakia has also applied a qualitative approach in determining its key categories. In its 2006 inventory submission, Slovakia has included the LULUCF sector in its key category analysis, but emissions/removals from cropland and grassland are not included in the analysis due to a misunderstanding related to the methodology. During the in-country review, Slovakia also provided a key category analysis without the LULUCF sector. In accordance with the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF), key category analyses both with and without LULUCF should be included in the inventory submission. The ERT noted that neither a description of the methodology used for identifying the key categories nor information on the level of aggregation is provided in the NIR. The ERT recommends that Slovakia perform the key category analyses in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, both with and without the LULUCF sector, and complementing the numerical analyses, as necessary, with the qualitative criteria given by the IPCC. Slovakia should also include a description of the key category analyses in the NIR, in accordance with the UNFCCC reporting guidelines.

28. Most of the key categories in Slovakia are in the energy and agriculture sectors. Slovakia has generally used country-specific values and/or methods for key categories. The ERT noted that the NIR does not provide information on how the results of the key category analyses are used in the development of the inventory. The ERT recommends that Slovakia use the results of the key category analyses in setting the priorities for the further development of its GHG inventory.

29. The key category analyses performed by the Party and the secretariat[2] produced different results. The ERT noted that they are difficult to compare, as Slovakia used emissions by gas and category as the basis for stationary combustion in the energy sector, whereas the secretariat used emissions by fuel in this category. In addition, the ERT identified some errors in the key category analyses by Slovakia that resulted from misinterpretation of the IPCC good practice guidance for key category analysis with LULUCF (removals have been included as negative values in the analysis). The ERT recommends that Slovakia follow the IPCC good practice guidance for LULUCF more closely and include absolute values of removals from LULUCF in the analysis.

30. Slovakia has not reported a key category analysis for the base year. The key category analysis by the secretariat without the LULUCF produced 16 key categories, including CO_2 emissions from stationary combustion (solid, gaseous, liquid and other fuels), CO_2 from road transportation, N_2O from agricultural soils (direct and indirect emissions), N_2O from manure management, CH_4 from enteric fermentation, solid waste disposal on land and wastewater handling, GHG emissions from some industrial processes (CO_2 from cement and lime production and N_2O from nitric acid production) and fugitive CH_4 emissions (coal mining and handling, oil and natural gas production, transmission and distribution). The key category analysis by the secretariat including LULUCF added the following categories to the list: CO_2 from forest land remaining forest land, cropland remaining cropland, grassland remaining grassland, and other land.

31. The key category analysis by the secretariat for 2004 produced results similar to those of the analysis for the base year. However, the number of key sources had increased, for example, CO_2 from

[2] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year or base year period as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. Because Slovakia had not submitted a key category analysis for the base year, the key categories identified by the secretariat have been used in this report.

limestone and dolomite use and iron and steel production had become key sources according to the level assessment.

2. Cross-cutting topics

32. The inventory is generally in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The following gaps and errors were identified:

(a) A lack of transparency in the NIR: the descriptions of methodologies should be improved;

(b) A QA/QC plan needs to be developed and implemented at all levels;

(c) The errors in the key category analysis should be corrected in Slovakia's next NIR.

33. Some specific deviations from the Revised 1996 IPCC Guidelines and the IPCC good practice guidance are addressed in the sector sections of this report below.

34. The inventory has been compiled largely in accordance with Article 7, paragraph 1, of the Kyoto Protocol and decision 15/CMP.1.

Completeness

35. Slovakia's inventory submission is generally complete. It covers the entire geographic area of the country. Some cases of incomplete reporting were identified, mainly associated with the inventory years 1991–1999, and in a few cases with the base year (1990).

Transparency

36. The ERT noted that in many cases the descriptions of methodologies and cross-cutting issues are not described in sufficient detail in the NIR. However, during the in-country review, most issues relating to the transparency of the 2006 NIR were clarified. The ERT noted that lack of transparency has been raised in previous inventory reviews and reiterates the recommendation to the Party to improve these descriptions in its next NIR.

37. For some source categories Slovakia uses methodologies and models originally developed under the Convention on Long-range Transboundary Air Pollution (CORINAIR and COPERT III). Neither the key assumptions of these models nor the country-specific data input to them are included in the NIR. The ERT recommends that Slovakia include these elements in its next NIR.

38. For the first time Slovakia has used the CRF Reporter software to produce the CRF tables. The ERT commends Slovakia for this improvement and found the CRF tables generally transparent. However, some gaps and inconsistencies in the use of the notation keys were identified. Moreover, some background tables and general tables have not been completed and country-specific approaches are not always explained. The ERT recommends that Slovakia further improve the completeness of its CRF tables and include all relevant information, and that it provide explanations in the documentation boxes in accordance with the UNFCCC reporting guidelines.

Consistency

39. The inventory is largely consistent over time. The ERT identified some specific inconsistencies in the use of activity data and emission factors, including the following: (a) the method used for splitting fuel used in aviation and navigation between domestic and international transport is inconsistent with the IPCC good practice guidance (see paragraphs 58 and 59); and (b) the times series for the CO_2 EFs used

for natural gas combustion was estimated using two different sets of data, with a potential overestimation of the base year emissions (see paragraph 62). These and other inconsistencies identified by the ERT are addressed in detail under the sector sections of this report below.

Comparability

40. Slovakia's inventory is generally comparable with those of other Parties, that is, the methodologies used and reporting formats are in accordance with the UNFCCC and IPCC guidelines, with some exceptions – for example, some industrial processes emissions are allocated in the energy sector; in the LULUCF sector, the land-use category other contains wetlands and settlements; and emissions from waste incineration with and without energy recovery are included in the energy sector for the years 1990–1999 and in the waste sector for the years 2000–2004. These issues are addressed in more detail in the sector sections of this report below.

Accuracy

41. Slovakia has provided uncertainty estimates for individual categories and for the whole inventory. The NIR does not, however, describe how the uncertainties have been estimated. The ERT was therefore unable to fully assess the level of accuracy of the estimates. It was informed about planned efforts to improve the uncertainty estimates for the 2008 submission and encourages the Party to carry out these plans.

Recalculations

42. The national system can in general ensure that recalculations of previously submitted estimates of emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance. The recalculations are initiated by the sectoral experts during the inventory preparation and are reviewed by the SHMI and endorsed by the Ministry of the Environment. As a rule they are applied to the whole time series. Slovakia has provided a separate CRF file for the base year (1990) for the first time in its 2006 submission. Recalculations are therefore reported only at the sector level for the base year. Although major recalculations are described in the NIR, the ERT noted that the reasons for them, the impact on the level and trend assessment, and justifications in terms of accuracy, transparency and/or completeness are not given in most cases. In CRF table 8, no explanatory information is provided on the recalculations. The ERT recommends Slovakia to provide documentation on the recalculations in accordance with the guidance on documentation in the IPCC good practice guidance on recalculations.

43. The ERT noted that recalculations in the 2006 submission resulted in increased estimates for total GHG emissions in the base year, by 1.8 per cent, and reduced estimates for total GHG emissions in 2003, by 1.0 per cent, compared to the estimates reported in the 2005 submission. The major changes by sector include energy (+2.2 per cent for the base year, –1.6 per cent for 2003) and industrial processes (+1.4 per cent for 2003).

44. During the in-country review and later on during the review process, the ERT received recalculated estimates for several (sub-)categories in the energy, industrial processes, agriculture and waste sectors, which resulted in reduced estimates for total GHG emissions in the base year and in 2003, by 0.08 per cent and 4.96 per cent, respectively compared to the estimates reported in the 2005 submission. The major changes by sector for the base year include: energy (+1.6 per cent), industrial processes (+15.5 per cent), agriculture (–12.7 per cent) and waste (–28.1 per cent). The recalculations involve the whole time series and are addressed in the sector sections below.

Uncertainties

45. Slovakia has provided uncertainty analyses for most categories (not including cropland and grassland) and for the inventory in total, following the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice

guidance). Slovakia uses mostly IPCC default uncertainties, and has also applied these in some cases to categories for which it uses country-specific emission factors and parameters. The ERT noted that country-specific uncertainty estimates are generally not explained in the NIR. It also identified some inconsistencies between the uncertainty estimates provided in the NIR and the uncertainty estimates provided separately as part of the submission. The ERT encourages Slovakia to improve the description of the general uncertainty assessment in the NIR, and to include sections on uncertainty estimation in all the sectoral chapters of the NIR.

46. During the in-country review, the ERT was informed by host country officials that a project to develop uncertainty estimates for the inventory has been initiated. Preliminary results of the project on uncertainty estimation in the waste sector (using the Monte Carlo approach) were presented. The ERT took note of these preliminary results with appreciation, and encourages Slovakia to use and document the results in its next inventory submission.

3. Areas for further improvement identified by the Party

47. The NIR identifies improvement of the consistency of the times series and transparency of choosing methodology and activity data as focus areas for improvement.

4. Areas for further improvement identified by the ERT

48. The ERT identified the following cross-cutting issues for improvement:

(a) Descriptions of methodologies used, including information on the collection of activity data and the choice of method and EFs, should be included in the NIR in order to increase the transparency of the reporting;

(b) Key assumptions and parameters in models used in calculating the estimates should be provided in the NIR, including those for internationally verified methods;

(c) The completeness of the inventory should be improved by filling the reporting gaps, that is, providing more disaggregated data for the estimates for the years 1990–1999, in the CRF tables;

(d) The structure of the NIR should be improved so that it follows more closely the UNFCCC reporting guidelines, including at subheading level. All the sectoral chapters should also address cross-cutting issues;

(e) The QA/QC plan should be improved and implemented in all sectors.

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

5. Energy

Sector overview

50. In 1990, the energy sector contributed 81.3 per cent of total national GHG emissions, excluding LULUCF. Fuel consumption accounted for 98.1 per cent of emissions from the sector, and fugitive CH_4 emissions for 1.9 per cent. Emissions of CO_2 accounted for 96.8 per cent of sectoral GHG emissions, with CH_4 and N_2O emissions contributing 2.6 per cent and 0.5 per cent, respectively. Within the sector, the major source categories are manufacturing industries and construction (1.A.2), energy industries (1.A.1) and other sectors (1.A.4), contributing 41.2, 26.8, and 18.7 per cent, respectively. Emissions from fuel combustion in transport (1.A.3) contributed 8.6 per cent of sectoral GHG emissions.

51. GHG emissions from the energy sector decreased sharply, by approximately 29.5 per cent from 1990 to 1994, and then show a relatively stable trend with some fluctuation since 1995. During the in-country review, the Party explained that this sharp decrease was due to the economic transition, new legislation on air pollutants, a major change in the country's industrial profile, technological advances, and a change of fuel mix (a shift from coal to gas).

Completeness

52. Slovakia has completed the CRF tables for all sources and gases in the energy sector for the years 1990 and 2000–2004. The CRF tables for the years 1991–1999, however, do not include estimates or activity data for the subcategories manufacturing industries and construction (1.A.2), other sectors (1.A.4) or other (1.A.5). Instead, AD and emissions from all stationary sources have been aggregated and reported under public electricity and heat production (1.A.1.a). The Party informed the ERT that the system for collecting AD changed from 2000 and that the data for the years 1990–1999 could not be disaggregated automatically. Instead, data for 1990 were input manually using the plant-specific REZZO (Register of Emissions and Sources of Air Pollution) fuel consumption database, and figures for the years 1991–1999 are expected to be ready in time for the 2008 submission. The ERT recommends that Slovakia finalize and verify the work and complete the relevant parts of the CRF tables with emission estimates or the appropriate notation keys for its next inventory submission.

Transparency

53. The ERT found the NIR's description of the energy sector to be generally lacking in transparency, for example, as regards the descriptions of the methods, activity data and emission factors used for estimating fuel combustion and the explanation of country-specific issues. The ERT recommends that the Party include more complete documentation on country-specific methodologies, EFs and net calorific values (NCVs). The Party should also describe in detail any country-specific circumstances that may result in values that are not comparable with those of other countries, for example, the EFs for the different types of coal. The ERT recommends the Party to include in its next NIR information describing the national energy balance, the NEIS and the REZZO database, including any information on changes to the methodologies used for these databases.

54. The ERT noted that there is no explanation of how emissions are separated between the energy sector and the industrial processes sector. During the in-country review, the Party informed the ERT that all process emissions from non-energy use of fuels are accounted for in the energy sector. Emissions from waste incineration with energy recovery from 1990 to 1999 are accounted for in the energy sector, but are recorded in the waste sector for years after 2000. The ERT encourages the Party to follow the Revised 1996 IPCC Guidelines more closely and allocate these emissions appropriately, or provide an explanation in the next NIR as to why process emissions and emissions from waste incineration are not separated from the emissions from waste combustion for energy.

55. The Party has aggregated all fuel consumption and corresponding emission estimates from other manufacturing industries and construction (1.A.2f.) as one category for 1990. To improve the transparency of the reporting, the ERT encourages the Party to specify the types of industry that are included in this category and to disaggregate the activity data and the emission estimates accordingly.

Reference and sectoral approaches

56. Slovakia has reported the reference approach for all years. In the year 1990, total CO_2 emissions according to the sectoral approach are higher than they are in the reference approach, by 2 per cent. The NIR explains that the differences in fuel consumption between these two approaches could be caused by the fact that a weighted average of NCVs was used in the reference approach and fuel-specific NCVs were used in the sectoral approach, and that the sectoral approach is more reliable than the reference approach. The ERT also noted that the discrepancy between the sectoral and the reference approach is

more significant for some years than for others. The ERT recommends the Party to work with the Statistical Office to examine the discrepancies and provide an adequate explanation. It also recommends the Party to work with the relevant institutions to examine discrepancies of the apparent consumption reported to the UNFCCC for Slovakia and that reported to the International Energy Agency (IEA).

57. The difference between the reference and the sectoral approach in 1990 is 2.1 per cent. The differences for liquid, solid, gas, and other fuels are –3.76, +18.66, –8.15 and –100 per cent, respectively. The ERT noted that other fuels contribute a significant share of emissions from the energy sector in the sectoral approach, but are not included in the reference approach. During the in-country review, host country experts explained that many fuels – such as coke oven gas, blast furnace gas, refinery gas, waste, and other gases – are included in other fuels for the sectoral approach but are separated into liquid, solid, or gas in the reference approach. The ERT recommends the Party either to classify other fuels in the appropriate types and document them in CRF table 1.A.c or to describe them in the NIR.

International bunker fuels

58. In its 2006 submission, Slovakia had included the landing and take-off (LTO) emissions of both domestic and international charter flights in the national total. However, the IPCC good practice guidance requires Parties to exclude all emissions from international bunker fuels from national totals, and to report them separately. Including LTO emissions from international aviation could lead to national emissions being overestimated. During the in-country review the ERT recommended the Party to estimate the emissions of domestic flights following the IPCC good practice guidance and to report all emissions from international flights under 1.C (international bunker fuels), and in response Slovakia provided revised estimates for this category during the review process. As fuel consumption data from air statistics were available only from 1994 onwards, the data for the four years 1990–1993 were based on expert judgement taking into account the real LTO cycles in the period. The fuel consumption split between domestic and international flights was also based on expert estimation: for jet kerosene, 90 per cent was assumed to be consumed by international flights and 10 per cent by domestic flights, while a reversed ratio – 10 per cent for international and 90 per cent for domestic flights – was used for aviation gasoline. The ERT welcomes the revised estimates, but at the same time encourages Slovakia to provide more detailed reasoning to support the expert estimations in its next NIR.

59. The emissions from ships that pass through Slovakia on the Danube River are included in 1.A.3(d) in the 2006 submission. However, page 2.51 of the IPCC good practice guidance states that all emissions from these fuels are to be excluded from national totals, and are to be reported separately. As including emissions from international marine transport could lead to national emissions being overestimated, the ERT recommended the Party to report the emissions from international marine transport passing through Slovakia under international bunkers. It also recommended the Party to base the emission estimates on amounts of fuel sold. In response to these recommendations, Slovakia provided revised estimates for this category during the review process. All navigation emissions were included in the international bunkers, and data on fuel sales were obtained from the State Shipping Administration from 1994 onwards; earlier data were based on expert estimation.

Feedstocks and non-energy use of fuels

60. Information on feedstocks and non-energy use of fuels is provided in CRF table 1.A.d for all years. However, in CRF table 1.A.c apparent energy consumption excluding non-energy use and feedstocks is reported as “not occurring” (“NO”). The Party explained that apparent energy consumption already excludes non-energy use. The ERT recommends the Party to make appropriate calculations for this table.

Key categories

Stationary combustion: solid fuels – CO_2

61. The 1990 and 2000–2004 values of the CO_2 emission factors for solid fuels (93.2–93.4 t/TJ) are outside the IPCC default range (94.6–106.7 t/TJ). During the in-country review, the Party explained that there are several types of coal combusted in Slovakia, all of which have different net calorific values and EFs, which are estimated by laboratories accredited by the Ministry of the Environment. For example, some types of black coal imported from the Czech Republic and Poland have EFs ranging from 90 to 93 t CO_2/TJ. The ERT recommends the Party to properly reference and document the studies on which the EFs are based and provide a summary in the NIR.

Stationary combustion: gaseous fuels – CO_2

62. The time series of the CO_2 emission factor for combustion of natural gas is inconsistent in the 2006 submission. The IPCC default EF (56.1 tonnes of CO_2 per TJ) was used for estimating CO_2 emissions from natural gas combustion for the base year. This default EF is higher than the country-specific EFs used by the Party for the years 2000–2004 (54.85 t CO_2/TJ to 55 t CO_2/TJ). During the review, the Party explained that it did not have sufficient information to be able to estimate country-specific EFs for these years. However, the natural gas consumed during this time period was mostly imported from Russia, as was the natural gas consumed during the five years 2000–2004. The ERT recommended the Party to collect information on the EF for natural gas combusted from 1990 to 1999, or to consider extrapolation using the country-specific EF from 2000 to 2004. In response, Slovakia revised the EF from the base year (revised value: 55.47 t CO_2/TJ) to 1999, using extrapolation based on the national data on the EF since the year 2000. The ERT welcomes the revised estimates.

Stationary combustion: other fuels – CO_2

63. Emissions from other fuels are high in the petroleum refining (1.A.1.b), iron and steel (1.A.2.a) and chemicals (1.A.2.c) subsectors. The Party informed the ERT that many fuels are included as other fuels, such as coke oven gas, blast furnace gas, refinery gas, waste, and other gases. The Party is recommended to allocate these fuels appropriately in order to improve comparability.

Stationary combustion: liquid fuels – CO_2

64. The following inter-annual changes in the CO_2 implied emission factor (IEF) for other – liquid fuels have been identified as outliers: 2000/2001 (–0.9 per cent), 2001/2002 (–1.0 per cent), 2002/2003 (+1.3 per cent) and 2003/2004 (–0.7 per cent). During the in-country review, the ERT was informed by host country experts that emission factors for liquid fuels are based on a paper entitled "Technical Standard for Air Protection, Monitoring of Emissions of Air Pollutants from Stationary Sources", which is in the Slovak language. The ERT recommends the Party to properly reference and document the studies on which the EFs are based and provide a summary in the NIR.

Transport: road transportation – CO_2

65. CO_2 emissions from mobile combustion are calculated using the COPERT III model which calculates emissions according to the tier 2 methodology. During the review, the Party explained that total fuel consumption, the composition of the vehicle fleet, driving mode, emission factors, and other statistics are used as input data. The ERT recommends the Party to provide documentation on the methodologies, activity data and EFs used in the NIR.

Fugitive emissions: coal mining and handling – CH_4

66. The NIR provides emission estimates using three different emission factors – those of the IPCC, the IEA, and Hornonitrianske bane Prievidza, a.s. (the main coal producer in Slovakia). Slovakia has

chosen to use the IEA EF, but the reason for doing so is not described in the NIR. During the review, the Party explained that the EFs used by the IEA are derived from detailed parameters such as the depth of mines and their location. Country-specific values were not used because they are derived not from the constant measurement of mines but on measurements taken only when the concentration of CH_4 in mines is within a specific range. The ERT recommends the Party to describe the reason for the choice of the IEA emission factor in its next NIR.

Non-key categories

Fugitive emissions: oil and natural gas – CO_2 and N_2O

67. Activity data and CH_4 emissions are reported for fugitive emissions (1.B.), but CO_2 and N_2O emissions are reported as "NO" in the 2006 submission. For the categories 1.B.1.a Coal mining and handling, 1.B.2.a Oil (ii. Production, iii. Transport, iv. Refining/storage), 1.B.2.b Natural gas (ii. production/processing, iii. Transmission, iv. Distribution, at industrial plants and power stations, in residential and commercial sectors), 1.B.2.c Venting and flaring (i. oil and ii. gas), 1.B.2.d Other (non-specified), the Party has estimated CH_4 emissions. According to the IPCC good practice guidance, however, minor CO_2 and N_2O emissions may occur from these sources. The ERT recommended the Party to use the appropriate notation keys or to estimate emissions of CO_2 and N_2O based on the default IPCC emission factors. During the review, in response, Slovakia provided CO_2 estimates for the categories 1.B.2.b–d; the EF was estimated from measured data on the composition of natural gas. N_2O emissions were estimated to be negligible, also on the basis of measured data. The ERT welcomes the recalculations and encourages Slovakia to provide a description of the methodologies and the EF calculations in its next NIR.

6. Industrial processes and solvent and other product use

Sector overview

68. In 1990, total GHG emissions from the industrial processes sector amounted to 4,922.77 Gg CO_2 equivalent in 1990, accounting for 6.8 per cent of total national GHG emissions (excluding LULUCF). Emissions of CO_2 and N_2O from solvents and other product use are reported as "NE" or "NO" for the inventory years 1990–1997. CO_2 emissions from mineral products (mainly cement and lime production) accounted for 59.8 per cent of sectoral emissions in 1990, followed by CO_2 emissions from metal production (11.0 per cent) and N_2O from chemical industries (23.7 per cent). Emissions of fluorinated gases contributed 5.5 per cent of sectoral emissions in 1990.

69. The ERT noted that CO_2 emissions from glass production, ammonia production, ferroalloys production and aluminium production are reported in the energy sector ("included elsewhere", "IE"). The ERT recommends the Party to follow the Revised 1996 IPCC Guidelines and the IPCC good practice guidance more closely and to allocate industrial process emissions from these activities to the industrial processes sector.

70. The secretariat identified the following key categories (on both trend and level assessment) in the industrial processes sector for the base year: CO_2 emissions from cement production, limestone and dolomite use, iron and steel production, and other; N_2O emissions from nitric acid production; emissions of PFCs from aluminium production; and emissions of HFCs from consumption of halocarbons and SF_6.

71. The ERT noted that Slovakia has provided a general discussion of uncertainties in the different source categories of the industrial processes sector, but no specific planned improvement measures are mentioned, nor is there any sector-specific discussion of QA/QC measures. The ERT recommends the Party to describe the planned improvement measures and to discuss the sector-specific QA/QC measures in its next NIR.

Key categories

Cement production – CO_2

72. Slovakia used two different methods for calculating these emissions. A tier 1 method was used to calculate estimates for the period 1990–1995, and a tier 2 method was used for the period 1996–2004. The ERT noted that the NIR provides uncertainty values, but does not describe how emissions are estimated or the QA/QC procedures in sufficient detail. The ERT recommends Slovakia to provide more detailed information on the method applied for estimating CO_2 from cement production and on QA/QC measures in its future submissions.

73. During the in-country review, the ERT was informed by host country experts that data on clinker production were available only for the inventory years since 1996. The clinker data estimates for the period 1990–1995 are therefore based on official cement production statistics and on plant-specific estimates of the fraction of clinker in cement. The ERT noted that no explanation is provided as to whether in the period 1990–1995 there were any imports or exports of clinker from Slovakia, as the IPCC good practice guidance requires. The exclusion of clinker imports or exports can lead to overestimation or underestimation of CO_2 emissions, respectively. The ERT therefore recommended Slovakia to investigate data on clinker imports or exports in the period 1990–1995 and to subtract imported or add exported clinker to the amount of clinker inferred from the volume of cement production. During the review, in response, Slovakia provided information based on contacts with the cement industry that no clinker was imported into or exported from Slovakia during the whole inventory period.

Lime production – CO_2

74. The ERT noted that Slovakia has taken the recommendations of previous reviews into consideration and incorporated lime purity aspects when computing its estimates of emissions from lime production. This has resulted in the recalculation of CO_2 emissions for the whole time series.

Limestone and dolomite use – CO_2

75. The ERT noted that Slovakia has recalculated the estimates of CO_2 emissions from limestone and dolomite use in 2006, based on more accurate data from production units. Emissions have been estimated for limestone and dolomite use in the production of calcium carbide, glass, and iron and steel. The ERT further noted that no details were provided on QA/QC in this category, and recommends that Slovakia include this detail in its future submissions.

Nitric acid production – N_2O

76. The NIR reports that IPCC default emission factors were used. While this is a good practice approach for new production plants, the ERT noted that there are some plants in Slovakia that were older than 20 years at the point in time when the estimates of N_2O from nitric acid production were made. This being the case, if the same EFs are used for both old and new plants, emissions from old nitric acid plants are likely to be underestimated. The ERT recommended Slovakia to use more accurate EFs for plants that are more than 20 years old, in accordance with the IPCC good practice guidance, and to revise the 1990 emission estimates accordingly. During the review Slovakia revised its estimates based on measurement data from one nitric acid producer in Slovakia. The emission factors by plant type, derived from the measurements, were used also for nitric acid plants not covered by the measurements. The ERT noted that the revised estimates are an improvement on the previous estimates, but encouraged Slovakia to document in more detail the measurements and the reasoning for their use also for plants where measurements have not been done.

Iron and steel production – CO_2

77. The ERT noted that Slovakia's approach to estimating these emissions is slightly different from the one recommended in the IPCC good practice guidance. The NIR presentation of this deviation in method from the one recommended in the IPCC good practice guidance was not transparent (which also prompted comments from previous reviews). During the in-country review, national experts clarified the deviation to the ERT. The ERT encourages Slovakia to improve on the explanation of the method that it provides in the NIR, and recommends an approach based on separating the consumption of reducing agent used in the production of iron from that used in the production of steel, if possible.

Non-key categories

Ammonia production – CO_2

78. The ERT noted that Slovakia does not separate the use of natural gas as feedstock from its energy use. Consequently, CO_2 emissions from the production of ammonia are reported to be included in the energy sector. The ERT encourages Slovakia to separate the use of natural gas as feedstock from its use as an energy source and to use appropriate emission factors for CO_2 emissions from energy production and ammonia production, or to provide in its next NIR an explanation as to why it reports the process emissions in the energy sector (see also para. 55).

Ferroalloys production – CO_2

79. The ERT noted that CO_2 emissions from ferroalloys production are reported to be included in the energy sector. The ERT encourages Slovakia to allocate ferroalloys production emissions to the industrial processes sector, if possible, in its future submissions (see also para. 54).

HFC emissions – HFCs

80. The NIR provides detailed explanations on emissions of HFCs (as well as PFCs and SF_6), indicating that the emission estimates are based on a structured survey of the potential users of HFCs. The HFC emissions are mainly from the use of coolants.

7. Agriculture

Sector overview

81. In 1990, GHG emissions from the agriculture sector amounted to 7,035.53 Gg CO_2 eq. and accounted for 9.8 per cent of total national GHG emissions (excluding LULUCF). N_2O from agricultural soils and manure management contributed 66.5 per cent of the sector's emissions, and CH_4 from enteric fermentation and manure management for the remaining 33.5 per cent.

82. The ERT noted that Slovakia's reporting on the agriculture sector is complete in terms of gases and time series. During the in-country review, host country experts clarified that emissions from field burning of agricultural residues (which is prohibited by law in Slovakia) and histosols (this type of soil is not cultivated in the interests of landscape protection) are not reported in the national GHG inventory. The ERT recommends the Party to state the reasons why it does not report these two categories in its next NIR.

83. The ERT noted that the structure of the NIR chapter on agriculture is not clear and that some elements of the reporting are missing. For example, the sub-subtitles "Methodology and Activity Data" and "Emission Factors and Emissions" are repeated four times under section 6.3.2 Direct N_2O emissions from cultivated soils, and no section on source-specific QA/QC, recalculations or planned improvements is included. The ERT recommends Slovakia to follow the guidance on the structure of the NIR that is given in the UNFCCC reporting guidelines, and to include all relevant information in its next NIR.

84. The ERT noted that the NIR does not provide sufficient information on the methods used (as tier 1 or tier 2). Furthermore, the description and discussion of the activity data are not adequate, for example, with regard to sources of data, population numbers for different animal groups, the characterization of animal types, amounts and types of fertilizers used, and animal waste management systems. Moreover, there is no information about the types of data provided by the different sources which it lists. The ERT recommends Slovakia to clearly describe and provide sufficient information regarding all AD utilized as well as its estimation methods in its next NIR.

85. Recalculations of the 1990 inventory have been performed for all the sources in the agriculture sector, as presented in CRF table 8(a). However, no explanatory information about the recalculations is included in the CRF tables or in the NIR. The ERT recommends Slovakia to provide an explanation of the recalculations in its next inventory submission.

Key categories

Agricultural soils – N_2O

86. Slovakia identified N_2O from agricultural soils as a key source for 1990. Emissions from this category amounted to 3,582.15 Gg CO_2 eq., accounting for 50.9 per cent of emissions from the sector. According to CRF table summary 3, the Party used a tier 2 method to calculate emissions from agricultural soils. The ERT noted that the NIR does not give a clear description of the methodology used or of verification of the country-specific data on the nitrogen (N) content in crops (N-fixing crops and other).

87. NIR tables 6.6 and 6.7 show nitrogen content values (in "%N in kg biomass") which are significantly higher than the IPCC default values (table 4.16 of the IPCC good practice guidance). For example, the NIR value for wheat is 0.81, while the IPCC default value is 0.28. The ERT noted that these values shown in tables 6.6 and 6.7 of the NIR are high, for example, for potatoes the value of 2.79 per cent nitrogen content indicates an unrealistic protein content of 17.4 per cent. Furthermore, the ERT noted that all N in fodder crops is reported as returned to soil, although it must be assumed that these crops are removed from the land. The ERT noted that the same problem was identified in previous review reports, and recommended Slovakia to follow the IPCC good practice guidance more closely and to revise its estimates on direct N_2O emissions from agricultural soils using the IPCC default N content in crop biomass residues (instead of the country-specific values). In response to this recommendation, Slovakia revised its estimates for N_2O emissions from crop residues using a country-specific method and N content values in crop residues. The method was described transparently and the country-specific values were referenced. This revision reduced the estimate of N_2O emissions from crop residues by more than 50 per cent, and the estimate of N_2O emissions from N-fixing crops by 30 to almost 50 per cent, for the whole time series compared to the previous estimates.

88. The Party reports uncertainty ranges for the EFs for direct N_2O emissions from agricultural soils (20–200 per cent), N_2O from animal waste management systems (25–150 per cent), indirect N_2O emissions from ammonia (NH_3) volatilization (20–200 per cent), and indirect N_2O emissions from leaching (10–500 per cent). The ERT encourages the Party to report these uncertainties as described in the IPCC good practice guidance, taking into account the country-specific data used in the inventory, and to describe how they have been estimated, in its next submission.

Enteric fermentation – CH_4

89. CH_4 from enteric fermentation accounted for 28.3 per cent of sectoral emissions in 1990. The ERT noted that the calculation methodology used is not clearly described in the NIR. According to CRF table summary 3, the Party used a tier 1 method with default EFs. The ERT recommended the Party to follow the Revised 1996 IPCC Guidelines and the IPCC good practice guidance more closely and use higher-tier methods for estimating emissions from key categories. In response, Slovakia revised its

estimate during the review process using the IPCC tier 2 methodology for cattle. As detailed input data were available only from 1997 onward, the emission factors for the earlier years were estimated using linear interpolation.

Manure management – N_2O

90. N_2O from manure management represents 15.6 per cent of sectoral emissions. The NIR provides country-specific data on animal waste management systems. However, the ERT noted inconsistencies in these data, for example, in table 6.5 the grazing period for non-dairy cattle is only 10 per cent, while for dairy cattle it is 20 per cent (non-dairy cattle are usually out to graze for longer than dairy cattle). The ERT reiterates the recommendation from previous reviews that the Party verify these data in order to increase transparency.

91. The ERT identified a possible inconsistency between CRF tables 4.B(b) and 4.D. Nitrogen excreted in pasture range and paddock as a percentage of total nitrogen excretion, as can be calculated from the data in table 4.B(b), equals 13.28 per cent, while $Frac_{GRAZ}$ is reported as 5.7 per cent. The ERT noted that these two values should be equal. The ERT reiterates the recommendation from previous reviews that Slovakia should check the consistency of and verify these data in order to increase transparency.

Non-key categories

Manure management – CH_4

92. CH_4 emissions from manure management accounted for 5.2 per cent of emissions from the agriculture sector in 1990. The ERT noted that the NIR does not provide an adequate description of the calculation methodology applied. According to CRF table summary 3, the Party used a tier 2 method with IPCC default EFs, whereas according to the NIR some of these EFs are country-specific. The ERT recommends Slovakia to provide sufficient description of the methodology to calculate CH_4 from manure management in the NIR.

8. Land use, land-use change and forestry

Sector overview

93. Slovakia has provided a complete inventory submission of CRF tables and an NIR in accordance with decision 13/CP.9 and the IPCC good practice guidance for LULUCF. In 1990 the LULUCF sector was a net sink of 2,388.5 Gg CO2 eq. or 3.3 per cent of total national emissions (excluding LULUCF). The size of the net sink increased by 77.1 per cent between 1990 and 2004, increasing sharply in 2001. It has fluctuated from year to year and is high for the more recent years (2001–2004), in the range of 4,200–5,200 Gg CO_2 equivalent, compared to 1,600 Gg for the year 1999 or 2,400 Gg for 1990.

94. Land converted to cropland is reported as "NE". During the review visit, host country experts explained that this land conversion is not currently happening in Slovakia. The ERT recommends that the notation be changed to "NO" if this is the case. Optional categories not reported include wetlands converted to cropland and wetlands and settlements converted to other land.

95. Other land is reported to be converted to forest land, cropland and grassland. The ERT recommends that the reasons for this be investigated and documented in the NIR, as it is unusual for other land to be changing to these land uses.

96. The Party's land-use definitions are not provided, and the ERT noted that they may not comply with the IPCC good practice guidance for LULUCF, as wetlands and settlements are included under other land. The ERT recommends the Party use the IPCC good practice guidance land-use category

definitions and to provide these definitions in its next NIR. If it is not possible to use the IPCC land-use definitions, the justification for the choice of land-use definitions should be documented in the NIR.

97. The ERT noted that the NIR does not provide transparent information on the methodology used to estimate emissions and removals due to LULUCF. QA/ QC procedures are not described for LULUCF. Uncertainty estimates are not provided in the NIR, although the host country experts provided such information to the ERT during the review.

98. Key category and uncertainty analyses have been carried out for the first time in 2006, including some LULUCF categories, but excluding cropland and grassland. The ERT recommends the Party to include all the LULUCF categories in its future key category and uncertainty analyses.

Key categories

Forest land remaining forest land – CO_2

99. The ERT noted that, generally, the methodology used is in accordance with the IPCC good practice guidance for LULUCF. However, it is not documented in the NIR. Country-specific emission factors are used, but there is a lack of documentation on how these were derived. The ERT recommends that information on country-specific EFs be included in the NIR.

Cropland remaining cropland – CO_2

100. The ERT noted that, generally, the methodology used is in accordance with the IPCC good practice guidance for LULUCF. However, there is a lack of transparency and of documentation in the NIR. The ERT recommends that more detailed information on the methodology be provided in the NIR.

Other land – CO_2

101. The ERT noted that the methodology used is not in accordance with the IPCC good practice guidance for LULUCF, as the latter defines other land as including "bare soil, rock, ice, and all other unmanaged land", from which CO_2 emissions and removals need not be reported under other land remaining other land. However, if conversion occurs – for example, if forest land or grassland is converted to other land – then emissions and removals need to be reported. The ERT recommends that the Party use the the IPCC good practice guidance for LULUCF definition of other land.

Grassland remaining grassland – CO_2

102. The ERT noted that, generally, the methodology used is in accordance with the IPCC good practice guidance for LULUCF. However, there is a lack of transparency in the description of the methodology, and the methodology is not adequately documented in the NIR. The ERT recommends that more detailed information on the methodology be provided in the NIR.

9. Waste

Sector overview

103. According to the 2006 submission, in 1990, GHG emissions from the waste sector accounted for 2.8 per cent of the national total. Between 1990 and 2004, sectoral emissions increased by 0.2 per cent. In 2006, the estimates for CH_4 emissions from solid waste disposal sites (SWDS) were recalculated, following a recommendation from previous reviews. These revised estimates were provided to the ERT during the in-country-review and are reflected in the re-submission of the 2006 inventory from June 2007. The revised estimates reduce the share of the waste sector in total national emissions to 2.1 per cent in the base year, while the increase between 1990 and 2004 changes to 46.1 per cent. The ERT based its review on the revised estimates for the waste sector.

104. Slovakia reports data on emissions for the following subcategories and gases from the waste sector: CH_4 from SWDS, CH_4 and N_2O from wastewater handling, and CO_2 and N_2O from waste incineration. Emissions from waste incineration are reported only for the period 2000–2004. Activity data, emission factors and other parameters are presented.

105. The revised estimates for SWDS are calculated with the first order decay (FOD) method and based on local parameters which reflect the waste management practices in Slovakia. QA/QC procedures include comparison of different approaches in the choice of methodology, as well as involving waste management experts in the inventory preparation. The uncertainty analysis is provided by using tier 1 methods of the IPCC good practice guidance, and additionally by tier 2 for CH_4 emissions from SWDS. Slovakia is planning improvements for the SWDS and waste incineration subcategories. The ERT also recommends the Party to recalculate its estimates for emissions from the wastewater handling subcategories (see paras. 108–110).

Key categories

Solid waste disposal sites – CH_4

106. The ERT noted that the emission factors and local parameters used are appropriate in that they reflect existing waste management practice. The activity data were received from the Statistical Office. In previous stages of the current review process and previous review reports there were comments on inappropriate trends in the emissions data. The ERT noted that this problem has been resolved as a result of the use of the FOD model (tier 2) and reconsideration of the local parameters. The value of the methane correction factor (MCF) was chosen as 0.6 for the years before 1993 because it was not known how many landfills were managed and unmanaged. For the period 1993–2003, the MCF was gradually changed from 0.6 to 1.0 because by the year 2003 all landfills had become managed. The ERT noted that this change in the MCF is the main cause of the difference in CH_4 emissions in the base year between the tier 1 and tier 2 estimations. As a result of the recalculations, the estimate for CH_4 emissions from SWDS in the base year has been reduced from 50.27 Gg to 22.37 Gg. At the same time, the estimates for emissions in the year 2004 increased, from 58.72 Gg to 63.99 Gg. The ERT considers the recalculations a significant improvement.

Wastewater handling – CH_4

107. CH_4 emissions from wastewater handling are based on methodologies which are appropriate and in line with the IPCC good practice guidance. For CH_4 emissions, the tier 1 method has been used and the emission factors are country-specific. The activity data were taken from the database on wastewater at the SHMI. The ERT noted that the trend in CH_4 emissions for wastewater handling fluctuates considerably, and the following inter-annual changes have been identified as outliers: 1992/1993 (–8.4 per cent), 1999/2000 (–11.5 per cent) and 2002/2003 (–9.6 per cent). The 2004 value is 33.5 per cent lower than the 1990 value. The change in the CH_4 IEF for industrial wastewater between 1999 and 2000 has been identified as an outlier. The 2000 value is 55.0 per cent lower than the 1999 value. During the in-country review, host country experts explained that the SHMI provided the data on wastewater quantity and these fluctuations derive from the changes in the AD from year to year. The ERT recommends Slovakia to check the consistency of its AD.

Non-key categories

Wastewater handling – N_2O

108. The NIR states that Slovakia used the methodology developed by the Fraunhofer Institut für Systemtechnik und Innovationsforschung in Karlsruhe, Germany, and IPCC emission factors. The ERT noted that no description of this methodology is provided in the NIR and recommends the Party to include a detailed description of it in its next NIR.

109. The ERT noted that N_2O emissions from domestic and commercial wastewater decreased between 1990 and 2000, and increased sharply between 2000 and 2002. The reason for this is that Slovakia has only taken commercial and domestic wastewater into account since 2001. The ERT recommends the Party to provide a complete and consistent time series for wastewater activity data.

Waste incineration – CO_2

110. The ERT noted that CO_2 emissions from waste incineration are reported only since 2000. During the in-country review, the ERT was informed that activity data on the quantity of waste incinerated are taken from waste incineration plants, and that, for 1990–1999, emissions from incinerated waste are reported in the energy sector under other fuels. Host country experts explained that this allocation does not affect the national totals. The ERT noted that, according to the IPCC good practice guidance, only emissions from waste incineration without energy recovery are to be reported in the waste sector. Emissions from incineration with energy recovery are to be reported in the energy sector as other fuels. The ERT recommends the Party to split emissions from waste incineration with and without energy recovery based on AD from incineration plants (see also para. 54).

C. Calculation of the assigned amount

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

112. Slovakia's base year is 1990 and the Party has also chosen 1990 as base year for HFCs, PFCs and SF_6. Slovakia's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol.

113. Based on Slovakia's original base year emissions, excluding land-use change – 73,360,100 Gg CO_2 equivalent – and its Kyoto Protocol target of 92 per cent, the Party calculated its assigned amount to be 337,456,459 tonnes CO_2 equivalent.

114. In response to inventory issues identified during the review, the Party submitted revised estimates of its base year inventory, which resulted in a recalculation of the assigned amount. Based on the revised estimates for Slovakia's base year emissions – 72,050.764 Gg CO_2 equivalent – the Party calculates its assigned amount to be 331,433,516 tonnes CO_2 equivalent. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

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

116. Based on its original total GHG emissions, excluding land-use change, for 2004 – 51,046,164.8 Gg CO_2 equivalent – Slovakia calculated its commitment period reserve to be 255,230,824 tonnes CO_2 equivalent.

117. In response to inventory issues identified during the review, the Party submitted revised estimates of its 2004 inventory. Based on the revised estimates, the Party calculates its commitment period reserve to be 242,974,886 tonnes CO_2 equivalent. The ERT agrees with this figure.

E. National registry

118. Slovakia has provided most of the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). Information on the international transaction log (ITL) connection and testing was not available because connection was scheduled to start in August 2007. The information provided is broadly transparent and in accordance with the requirements of these reporting guidelines requirements. However, the ERT

noted that some of the information is not clearly indicated in the initial report, for example, conformity with the DES, procedures to minimize discrepancies, security measures to prevent unauthorized manipulation and to prevent operator error, and disaster management.[3]

119. During the initial review, the ERT was provided with additional and updated information on the national registry of Slovakia. The ERT recommends Slovakia to provide this information on its national registry, as indicated by the guidelines mentioned above, in its next inventory report under the Kyoto Protocol.

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

121. During the in-country review, the ERT was informed that the internal operational test of the registry for network connection would be completed by August 2007. The initialization process was expected to be completed by late August and the registry to be fully operational by end of December 2007. Information on the registry of Slovakia is publicly available through the Internet (URL <http://CO_2.dexia.sk>).

122. The ERT was also informed about the procedures and security measures in place to minimize discrepancies, terminate transactions and correct problems, and minimize operator error. These procedures and security measures include a user guide which is available for downloading on the registry website, periodic workshops for account holders to introduce new functionalities of the software, registry software pre-checks of all data submitted before they are sent to the CITL/ITL, built-in business rules to maintain database integrity, application of the "four-eye" principle with registry administrators, and user-friendly functions that help to minimize user mistakes during the typing in of any information to the application screen.

123. The ERT acknowledged the effort made by Slovakia to put in place adequate security measures for the registry to prevent unauthorized manipulation and to prevent operator error. The registry services are being provided by a professional IT services host (Dexia Bank in Zilina, a city located 200 km east of Bratislava) which ensures that operations are performed by more than one computer per time. The computers are located in a protected area. Registry system data are routinely mirrored to other computers sited at another location 2 km away, using a high-speed network. The ERT gained the overall impression that Slovakia attaches adequate importance, and allocates adequate resources, including human resources, to the development, operation and maintenance of the registry.

[3] See items d) and e) of paragraph 32 of decision 15/CMP.1.

Table 5. Summary of information on the national registry system

Reporting element	Provided in the initial report	Comments
Registry administrator		
Name and contact information	Yes	
Cooperation with other Parties in a consolidated system		
Names of other Parties with which Slovakia cooperates	No	The ERT was informed that no such cooperation exists.
Database structure and capacity of the national registry		
Description of the database structure	Yes	
Description of the capacity of the national registry	Yes	
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems	Yes	
Procedures for minimizing and handling of discrepancies		
Description of the procedures employed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units	Yes	
Description of the steps taken to terminate transactions where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction	Yes	
Prevention of unauthorized manipulation and operator error		
An overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error	Yes	
An overview of how these measures are kept up to date	No	
User interface of the national registry		
A list of the information publicly accessible by means of the user interface to the national registry	Yes	
The Internet address of the interface to Slovakia's national registry	Yes	
Integrity of data storage and recovery		
A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster	Yes	
Test results		
The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems.	Yes	

124. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report (IAR) that was forwarded to the ERT by the administrator of the international transaction log, pursuant to decision 16/CP.10 on 14 September 2007.

125. The ERT reiterated the main findings of this report, including that the registry has fulfilled sufficient obligations regarding conformity with the DES. These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery. The ITL operator identified some limitations during the evaluation of the documentation of Slovakia's registry, including the following: the application logging evidence provided by Slovakia does not contain examples of database and transaction logging; the evidence of usage of the time validation plan referred to in the documentation has not been provided; the documentation provided indicates that the test plan has not yet been completed in full; the

description provided to support the test reports is high-level and the evidence supporting the test report is lacking; the documents provided only partially address the questionnaire in relation to the operational plan; and the evidence of usage to support the change management explanation is missing. The Party informed the ERT that it will rectify these issues before the registry is fully operational with the ITL, and not later than the end of 2007.

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

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

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

Table 6. Selection of LULUCF meters

Parameters for forest definition		
Minimum tree cover	20%	
Minimum land area	0.3 ha	
Minimum tree height	5 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3, activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4, activities		
Forest land management	Not elected	Not Applicable
Cropland management	Not elected	Not Applicable
Grazing land management	Not elected	Not Applicable
Revegetation	Not elected	Not Applicable

128. The ERT noted that all parameters are within the range of values defined by decision 16/CMP.1 and are consistent with what Slovakia has reported to the Food and Agriculture Organization of the United Nations (FAO).

III. Conclusions and recommendations

A. Conclusions

129. The expert review team concluded that the information provided by Slovakia in the initial report and during the review process is complete and in accordance with the relevant provisions of decision 13/CMP.1, relevant elements of section I of the annex to decision 15/CMP.1, and other relevant decisions of the CMP; that the assigned amount pursuant to Article 3, paragraphs 7 and 8, has been calculated in accordance with the annex to decision 13/CMP.1, and is consistent with the revised inventory estimates as submitted and reviewed; and that the calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1, and is consistent with the revised inventory estimates as submitted and reviewed; and the LULUCF definitions are within the agreed range.

130. Slovakia's national system for the estimation of greenhouse gas emissions is based on the system for estimating air pollutants. Overall, the system includes most elements of a national system. However, the arrangements of the national system were formalized only during the review process, and resources for the coordination and compilation of the inventory need to be enhanced. At present the national system is dependent largely on the expertise and capacity of one person. Moreover, the QA/QC plan is still vague, and needs to be formulated and implemented in a more vigorous way.

131. Slovakia's greenhouse gas inventory is largely complete and is compiled in accordance with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. It has a robust data collection system, building mainly on national statistics, and plant-specific data for the energy and industrial processes sectors. Country-specific activity data and emission factors are used for most key categories. In spite of this, the 2006 submission included several deficiencies, many of which were corrected in the re-submission of the 2006 GHG inventory from June 2007. Most significantly, the descriptions in the NIR need to be made more transparent and the data gaps in the CRF tables, mainly for the period 1990–1999, in particular in the energy sector, need to be filled in future submissions.

132. Based on Slovakia's base year emissions (72,050,764 tonnes CO_2 equivalent, including the revised estimates provided in the energy, industrial processes, agriculture and waste sectors) and its Kyoto Protocol target (92 per cent) the Party calculates its assigned amount to be 331,433,516 tonnes CO_2 equivalent. Slovakia calculates its commitment period reserve to be 242,974,886 tonnes CO_2 equivalent. The ERT agrees with these figures.

133. Slovakia's choice of the parameters to define forest (minimum tree cover: 20 per cent; minimum land area: 0.3 ha; minimum tree height: 5 m) are in accordance with decision 16/CMP.1. Slovakia has elected not to account for any activities under Article 3, paragraph 4, of the Kyoto Protocol. It has also elected commitment period accounting for the Article 3, paragraph 3, activities.

134. Based on the results of the in-country visit and the technical assessment, as reported in the independent assessment report, the ERT concluded that the national registry is sufficiently compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1.

B. Recommendations

135. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of Slovakia's information presented in the initial report. Recommendations were also made relating to the choice of methods, AD and EFs in the GHG inventory. Many of the recommendations were implemented during the review process, for example, all identified potential problems that could have led to an overestimation of the base year emissions were resolved. The remaining key recommendations[4] are that Slovakia:

(a) Improve the resources for the coordination and compilation of the national inventory and involve sectoral experts in this process, as appropriate;

(b) Further develop its QA/QC plan and implement it in accordance with the IPCC good practice guidance;

(c) Enhance and improve the transparency of the methodology descriptions, especially for country-specific methods, in its next NIR: the structure should be improved to follow the guidance given in the UNFCCC reporting guidelines; and the sectoral chapters should include time series of activity data, and give the reasoning for the choice of methods and EFs, as well as descriptions of how cross-cutting issues are handled on the sectoral level;

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

(d) Complete the relevant parts of the CRF tables for the years 1991–1999 with emission estimates, in particular in the energy sector, and provide information in all background data tables in the CRF in its next inventory submission;

(e) Improve the uncertainty estimates so that they correspond to the methods and data used in the inventory;

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

136. Future reviews should focus on whether:

(a) The structure of the NIR and the transparency of the methodology description have been improved; this issue has been raised in several previous reviews;

(b) The QA/QC plan has been developed, and how it is implemented, especially at the sectoral level;

(c) Emission estimates have been provided for all years in the CRF tables, in particular in the energy sector.

C. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

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

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B. Additional information provided by the Party

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Siska B and Horak J. 2007. N_2O Emissions From Sandy Loam Soils of Danubian Lowland in Conditions of Climate Change. SPU Nitra, Department of Biometeorology.

Technical Standard for Air Protection, Monitoring of Emissions of Air Pollutants from Stationary Sources.

Annex II

Acronyms and abbreviations

AD	activity data
CH_4	methane
CITL	Community Independent Transaction Log (European Community)
CMP	Conference of the Parties serving as the Meeting of the Parties
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DES	data exchange standards
EF	emission factor
ERT	expert review team
EU	European Union
FOD	first order decay
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GJ	gigajoule (1 GJ = 10^9 joule)
HFCs	hydrofluorocarbons
IAR	independent assessment report
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LTO	landing and take-off
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane correction factor
Mg	megagram (1 Mg = 1 tonne)
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NE	not estimated
NEIS	National Emissions Inventory System
NIR	national inventory report
NO	not occurring
NSISP	National Greenhouse Gas Emission Inventory and Projection System
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
REZZO	Register of Emissions and Sources of Air Pollution
SF_6	sulphur hexafluoride
SHMI	Slovak Hydrometeorological Institute
STU	Slovak Technical University
SWDS	solid waste disposal site
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change

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