COMPLIANCE COMMITTEE **CC/ERT/ARR/2014/34**
17 September 2014

Report of the individual review of the annual submission of Slovakia submitted in 2013

Note by the secretariat

The report of the individual review of the annual submission of Slovakia submitted in 2013 was published on 1 September 2014. On 16 September 2014, a corrigendum to the report was published. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report and the corrigendum are considered received by the secretariat on these same dates. This report, FCCC/ARR/2013/SVK, and a corrigendum to this report, FCCC/ARR/2013/SVK/Corr.1, both contained in the annex to this note, are 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 individual review of the annual submission of Slovakia submitted in 2013*

Corrigendum

Paragraph 28

For the existing text *substitute*

28. The ERT noted several fluctuations in the trends of annual implied emission factors (IEFs) in the period 1990–2011 which are not sufficiently explained or justified in the NIR. For example, the ERT noted changes in the IEF for N_2O: 5.40 kg/TJ in 1999 to 3.77 kg/TJ in 2011 for gasoline; for diesel oil it was 1.93 kg/TJ in 2011, which is 41.2 per cent lower than the 1990 value (3.28 kg/TJ). The ERT recommends that the Party explain these trends to enhance the transparency of its reporting.

* In the symbol for this document, 2013 refers to the year in which the inventory was submitted and not to the year of publication.

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Contents

I. Introduction and summary

1. This report covers the review of the 2013 annual submission of Slovakia, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 2 to 7 September 2013 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Riccardo de Lauretis (Italy); energy – Mr. Daniel Tutu Benefoh (Ghana), Ms. Renee Kidson (Australia), Mr. Ricardo Fernandez (European Union (EU)) and Mr. Sangay Dorji (Bhutan); industrial processes and solvent and other product use – Mr. Stanford Mwakasonda (United Republic of Tanzania) and Ms. Valentina Idrissova (Kazakhstan); agriculture – Mr. Jean Stephan (Lebanon) and Mr. Kohei Sakai (Japan); land use, land-use change and forestry (LULUCF) – Mr. Eiichiro Nakama (Japan), Ms. Marina Vitullo (Italy) and Mr. Richard Volz (Switzerland); and waste – Ms. Estela Santalla (Argentina) and Mr. Kai Skoglund (Finland). Mr. de Lauretis and Mr. Tutu Benefoh were the lead reviewers. The review was coordinated by Mr. Vitor Góis Ferreira (UNFCCC secretariat).

2. In accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1) (hereinafter referred to as the Article 8 review guidelines), a draft version of this report was communicated to the Government of Slovakia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report. All encouragements and recommendations in this report are for the next annual submission, unless otherwise specified. The expert review team (ERT) notes that the 2012 annual review report of Slovakia was published after the submission of the 2013 annual submission.

3. In 2011, the main greenhouse gas (GHG) in Slovakia was carbon dioxide (CO_2), accounting for 83.2 per cent of total GHG emissions[1] expressed in CO_2 equivalent (CO_2 eq), followed by methane (CH_4) (9.1 per cent) and nitrous oxide (N_2O) (6.6 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.1 per cent of the overall GHG emissions in the country. The energy sector accounted for 69.6 per cent of total GHG emissions, followed by the industrial processes sector (18.2 per cent), the agriculture sector (6.9 per cent), the waste sector (4.9 per cent) and the solvent and other product use sector (0.4 per cent). Total GHG emissions amounted to 45,296.96 Gg CO_2 eq and decreased by 36.9 per cent between the base year[2] and 2012. The ERT concludes that the description in the national inventory report (NIR) of the trends for the different gases and sectors is reasonable.

4. Tables 1 and 2 show GHG emissions from sources included in Annex A to the Kyoto Protocol (hereinafter referred to as Annex A sources), emissions and removals from the LULUCF sector under the Convention and emissions and removals from activities under Article 3, paragraph 3, and, if any, elected activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector and activity, respectively. In table 1, CO_2, CH_4 and N_2O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

5. Additional background data on recalculations by Slovakia in the 2013 annual submission, as well as information to be included in the compilation and accounting database, can be found in annex I to this report.

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

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sources included in Annex A to the Kyoto Protocol only.

Table 1

Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year[a] to 2011

			Gg CO_2 eq							*Change (%)*
		Greenhouse gas	*Base year[a]*	*1990*	*1995*	*2000*	*2008*	*2009*	*2010*	*2011*	*Base year–2011*
Annex A sources		CO_2	60 745.23	60 745.23	44 879.11	41 367.41	40 492.91	35 802.01	37 911.16	37 671.87	–38.0
		CH_4	4 414.17	4 414.17	4 037.22	4 247.68	4 378.94	4 195.41	4 107.72	4 138.49	–6.2
		N_2O	6 351.04	6 351.04	4 159.70	3 581.79	3 852.08	3 541.50	3 416.27	3 009.36	–52.6
		HFCs	NA, NO	NA, NO	11.65	77.01	335.17	380.08	420.16	439.50	NA
		PFCs	271.37	271.37	114.32	11.65	36.16	17.76	21.15	17.00	–93.7
		SF_6	0.03	0.03	9.91	13.11	18.51	19.39	19.90	20.74	66 665.2
KP-LULUCF	Article 3.3[b]	CO_2					–318.75	–257.39	–371.23	–489.33	
		CH_4					NA	NA	NA	NA	
		N_2O					NA	NA	NA	NA	
	Article 3.4[c]	CO_2	NA				NA	NA	NA	NA	NA
		CH_4	NA				NA	NA	NA	NA	NA
		N_2O	NA				NA	NA	NA	NA	NA

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The "base year" for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2011

			Gg CO_2 eq							*Change (%)*
		Sector	*Base year[a]*	*1990*	*1995*	*2000*	*2008*	*2009*	*2010*	*2011*	*Base year–2011*
Annex A		Energy	53 875.84	53 875.84	38 947.71	35 646.59	33 546.07	30 200.64	31 789.70	31 533.37	–41.5
		Industrial processes	9 543.26	9 543.26	8 552.32	8 293.99	9 901.67	8 374.69	8 621.23	8 248.22	–13.6
		Solvent and other product use	147.15	147.15	121.53	85.04	166.59	164.38	164.35	170.54	15.9
		Agriculture	7 124.26	7 124.26	4 357.64	3 495.99	3 129.46	3 052.37	3 098.29	3 117.52	–56.2
		Waste	1 091.33	1 091.33	1 232.71	1 777.04	2 369.99	2 164.06	2 222.79	2 227.32	104.1
		LULUCF	NA	–10 019.11	–10 778.56	–10 713.89	–7 218.64	–7 437.46	–6 915.13	–7 467.26	NA
		Total (with LULUCF)	**NA**	**61 762.74**	**42 433.35**	**38 584.76**	**41 895.13**	**36 518.68**	**38 981.23**	**37 829.71**	**NA**
		Total (without LULUCF)	**71 781.85**	**71 781.85**	**53 211.91**	**49 298.65**	**49 113.78**	**43 956.15**	**45 896.36**	**45 296.96**	**–36.9**
		Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	
KP-LULUCF	Article 3.3[c]	Afforestation and reforestation					–453.55	–469.73	–512.43	–527.85	
		Deforestation					134.80	212.34	141.19	38.53	
		Total (3.3)					**–318.75**	**–257.39**	**–371.23**	**–489.33**	
	Article 3.4[d]	Forest management					NA	NA	NA	NA	
		Cropland management	NA				NA	NA	NA	NA	NA
		Grazing land management	NA				NA	NA	NA	NA	NA
		Revegetation	NA				NA	NA	NA	NA	NA
		Total (3.4)	**NA**				**NA**	**NA**	**NA**	**NA**	**NA**

Abbreviations: KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] "Base year" for sources included in Annex A to the Kyoto Protocol refers to the base year under the Kyoto Protocol, which is1990 for all gases. The "base year" for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 7) are not included in Annex A to the Kyoto Protocol and are therefore not included in national totals.

[c] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[d] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

6. The 2013 annual inventory submission was submitted on 15 April 2013; it contains a complete set of common reporting format (CRF) tables for the period 1990–2011 and an NIR. A revised NIR was submitted on 28 August 2013. Slovakia also submitted the information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry, and the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 15 April 2013. The annual submission was submitted in accordance with decision 15/CMP.1.

7. The full list of materials used during the review is provided in annex II to this report.

2. Overall assessment of the inventory

8. Table 3 contains the ERT's overall assessment of the annual submission of Slovakia. For recommendations for improvements related to cross-cutting issues for specific categories, please see the paragraphs cross-referenced in the table.

Table 3
The expert review team's overall assessment of the annual submission

		General findings and recommendations
The expert review team's (ERT's) findings on completeness of the 2013 annual submission		
Annex A sources[a]	Complete	Mandatory: none
		Non-mandatory: CO_2 emissions from coal mining and handling (see para. 17 below); CH_4 emissions from wastewater handling (sludge) (see para. 71 below)
Land use, land-use change and forestry[a]	Complete	Mandatory: none
		Non-mandatory: none (see para. 44 below)
KP-LULUCF	Not complete	Slovakia has not provided in the NIR clear verifiable information that the unaccounted dead wood pool was not a net source of anthropogenic greenhouse gas emissions in accordance with annex to decision 15/CMP.1 para 6(e) (see para. 78 below)
		Some emissions reported as "NO" may

		General findings and recommendations
		represent an underestimation of emissions (see paras. 76, 77, 79 and 83 below)
The ERT's findings on recalculations and time-series consistency in the 2013 annual submission	Generally consistent	Possible time-series inconsistencies have been identified in the LULUCF sector (see paras. 56 and 57 below) and the waste sector (see paras. 69 and 73 below)
The ERT's findings on verification and quality assurance/quality control procedures in the 2013 annual submission	Sufficient	Slovakia performs category-specific QA/QC procedures and verification activities. The updated QA/QC procedures and plan have been improved in 2013 on the basis of the outcomes and recommendations of the review process The ERT recommends that the Party further improve the QA/QC procedures, especially for the energy sector (see para. 17 below), in particular with respect to national and international statistics (see paras. 21–23 and 26 below), for the LULUCF sector (see paras. 50 and 53 below) and for the waste sector (see para. 68 below)
The ERT's findings on the transparency of the 2013 annual submission	Generally transparent	The ERT identified areas where the transparency of the NIR could be further improved (e.g. by including in the NIR the information supplied during the review), in the key category analysis (see table 4 below), and in the energy sector (see paras. 17, 19, 23, 27 and 28 below), the industrial processes sector (see paras. 31 and 36 below), the agriculture sector (see paras. 39, 40 and 41 below) and the LULUCF sector (see paras. 46–54, 57–59 and 63–64 below) and for KP-LULUCF activities (see paras. 75, 78–80 and 81 below). The ERT recommends that the Party enhance the transparency of its reporting for these areas

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, CRF = common reporting format, KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control.

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, or the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*).

3. Description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Inventory planning

9. The NIR described the national system for the preparation of the inventory. The Department of Emissions and Air Quality Monitoring (OMEaKO) of the Slovak

Hydrometeorological Institute (SHMU) is the single national entity and has overall responsibility for the national inventory, as delegated by the Ministry of Environment (MoE). OMEaKO is also responsible for the preparation of an "Annual plan and progress report" for tasks to be prioritized and performed for the subsequent year's annual submission, which is sent for approval by MoE. Additional staff at SHMU are responsible for the National Emission Information System (NEIS) database, which contains information on stationary combustion sources.

10. Other organizations are also involved in the preparation of the inventory. Indeed, the preparation of the inventory at the sectoral level is highly decentralized and delegated to sectoral experts at external institutions and organizations. The external institutions and organizations cooperate under annual contracts, based on framework contracts for the period 2010–2014. The sectoral experts nominated into the Slovak national system are listed in table 1.2 of the NIR. In particular, the cooperation with the Transport Research Centre in Brno is based on consultations on road transport issues, while the National Forest Centre in Zvolen is responsible for the reporting requirements under Article 3, paragraph 3, of the Kyoto Protocol. In response to recommendations made in previous review reports, a more clear description of the inventory planning and preparation process has been included in the NIR in the Party's 2013 annual submission, and the ERT commends the Party for that action.

Inventory preparation

11. Table 4 contains the ERT's assessment of Slovakia's inventory preparation process. For recommendations for improvements related to specific categories, please see the paragraphs cross-referenced in the table.

Table 4
Assessment of inventory preparation by Slovakia

		General findings and recommendations
Key category analysis		
Was the key category analysis performed in accordance with 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 the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF)?	Yes	
Approach followed?	Tier 1 and tier 2	
Were additional key categories identified using a qualitative approach?	No	
Has the Party identified key categories for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol following the guidance on establishing the relationship between the activities under the Kyoto Protocol and the associated key categories in	Yes	The information reported in the NIR is not completely in agreement with the information reported in the KP-LULUCF tables. The ERT recommends that the Party increase the transparency of its reporting on

		General findings and recommendations
the UNFCCC inventory?		this aspect
Does the Party use the key category analysis to prioritize inventory improvements?	Yes	
Are there any changes to the key category analysis in the latest submission?	No	Limestone and dolomite use – CO_2, manure management – CH_4 and other land – CO_2 were identified as key categories in the previous submission, but have not been identified as key in the latest submission
Assessment of uncertainty analysis		
Approach followed?	Tier 1 and tier 2	A tier 2 approach was used for the energy, industrial processes, solvent and other products use and waste sectors
Was the uncertainty analysis carried out in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	The uncertainty analysis excluding the LULUCF sector, has not been reported. The ERT recommends that the Party report uncertainty values with and without LULUCF, in the NIR In addition, see paragraph 48 below
Quantitative uncertainty (including LULUCF)	Level = 12.9% Trend = 4.4%	
Quantitative uncertainty (excluding LULUCF)		

Abbreviations: ERT = expert review team, KP-LULUCF = LULUCF emissions and removals under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report.

Inventory management

12. Slovakia has a centralized archiving system, which includes the archiving of disaggregated emission factors (EFs) and activity data (AD), and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal documentation on quality assurance/quality control (QA/QC) procedures, external and internal reviews, and documentation on annual key categories and key category identification and planned inventory improvements. The archive is kept at SHMU. The documents are archived in electronic and printed forms. Security measures are in place and the access to sensitive documents is through user name and password. During the review, the ERT was provided with the requested additional archived information.

4. Follow-up to previous reviews

13. In order to comply with the relevant recommendations made in previous review reports many changes were performed by Slovakia for its 2013 annual submission. The ERT welcomes the improvements made, which are reported in detail in the NIR: chapter 10 contains an extensive list of all the categories subject to improvements in the estimation methodologies.

14. The NIR also contains an improvement plan for future annual submissions. The ERT commends the Party for this information. The main pending issues not yet addressed by Slovakia but planned for the near future are:

(a) To improve transparency with regard to the use of AD from the different data sources employed in the energy sector and to ensure that the AD used are consistent between the different available databases;

(b) To develop a plan to improve the emission estimates for the wastewater handling subcategories;

(c) To improve the transparency by providing, in the next annual submission, a clear description of the process to determine annual loss of biomass and fraction of biomass burned on site.

5. Areas for further improvement identified by the expert review team

15. During the review, the ERT identified a number of areas for improvement, including some related to specific categories. These are listed in the relevant chapters of this report and in table 8.

B. Energy

1. Sector overview

16. The energy sector is the main sector in the GHG inventory of Slovakia. In 2011, emissions from the energy sector amounted to 31,533.37 Gg CO_2 eq, or 69.6 per cent of total GHG emissions. Since 1990, emissions have decreased by 41.5 per cent. The key drivers for the fall in emissions were: switching fuel use from coal and oil to natural gas; market-driven changes such as the removal of price subsidies for electricity production; economic restructuring towards less-energy-intensive production (mostly after Slovakia became a member State of the European Union (EU)); and the adoption of national legislation on air quality aimed at the reduction of emissions of common air pollutants. Within the sector, 31.2 per cent of the emissions were from manufacturing industries and construction, followed by 29.9 per cent from energy industries, 20.2 per cent from transport, 11.9 per cent from other sectors and 3.5 per cent were from fugitive emissions from fuels (1.1 per cent from solid fuels and 2.4 per cent from oil and natural gas). The remaining 3.3 per cent were from other (energy).

17. The inventory and the CRF tables include emission estimates for all categories, gases and fuels used in the energy sector, and are complete in terms of years and geographical coverage, where ever methodologies are available in 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 the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines). During the review, the ERT noted that Slovakia reported CO_2 emissions from coal mining and handling as "NO" (not occurring) although coal mines do occur in the country. Responding to questions raised by

the ERT during the review, Slovakia provided information showing that the volume of CO_2 in fugitive gases from mined coal is below a measurement detection threshold, thereby justifying the use of the notation key "NO". The ERT recognizes that there are no specific methods for estimating fugitive CO_2 emissions from coal mines in the IPCC good practice guidance. However, the ERT further notes that there are no thresholds below which emissions from categories do not have to be reported and therefore recommends that the Party change the notation key from "NO" to "NE" (not estimated). The ERT also encourages Slovakia to improve its QA verification checks in order to ensure that all non-CO_2 combustion emissions are reported.

18. During the review, responding to questions raised by the ERT, Slovakia stated that it has commenced implementing actions towards the harmonization of official statistical data and other national data sets, in order to ensure that the AD used to estimate emissions from the energy sector and the fuel use data from the NEIS database are consistent with the national energy supply balance and data reported to international organizations. To achieve this goal, Slovakia's actions included performing an input-output balance for refineries and comparing the AD between the different databases on disaggregated levels. The ERT commends Slovakia for these actions and further reiterates the recommendation made in the previous review report that Slovakia include in the NIR a table presenting a comparison by fuel type, of fuel consumption data from the NEIS database and from the national statistics (see paras. 23 and 26 below). The ERT also reiterates the encouragement in the previous review report[3] that the Party implement specific QC checks for components of the energy sector other than AD.

19. In addition, the ERT noted that Slovakia could improve the transparency of its reporting of the information on the national energy balance in the NIR. The ERT recommends that Slovakia provide a brief summary of the national energy balance in the NIR, for example in accordance with the structure of the NIR outlined in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines for annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines). For that purpose, the ERT encourages Slovakia to consider summarizing the energy balance table, for publication in the NIR, by aggregating some of the energy subcategories according to the classification reported in the CRF tables.

2. Reference and sectoral approaches

20. Table 5 provides a review of the information reported under the reference approach and the sectoral approach, as well as comparisons with other sources of international data. Issues identified in table 5 are more fully elaborated in paragraphs 21–25 below.

Table 5
Review of reference and sectoral approaches

		Paragraph cross-references
Difference between the reference approach and the sectoral approach	Energy consumption: 51.55 PJ, 11.71% CO_2 emissions: 2 677.30 Gg CO_2 eq, 8.86%	
Are differences between the reference approach and the sectoral approach adequately explained in the NIR and the	Yes	21 and 22

[3] FCCC/ARR/2012/SVK, paragraph 56.

CRF tables?		
Are differences with international statistics adequately explained?	No	23
Is reporting of bunker fuels in accordance with the UNFCCC reporting guidelines?	No	24
Is reporting of feedstocks and non-energy use of fuels in accordance with the UNFCCC reporting guidelines?	No	25

Abbreviations: CRF = common reporting format, NIR = national inventory report, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

Comparison of the reference approach with the sectoral approach and international statistics

21. CO_2 emissions from fuel combustion were calculated using the reference approach and the sectoral approach. For the year 2011, there is a difference of 24.8 per cent in the CO_2 emission estimates and 46.9 per cent for solid fuel (coking coal) consumption between the reference and the sectoral approaches: the higher estimates were calculated using the reference approach. As explained in the NIR and confirmed by the Party to the ERT during the review week, the allocation of non-energy use of coking coal can explain this significant difference in solid fuel consumption. The Party also stated that the difference would probably be smaller in future annual submissions, because it is planning to use a new method to report the carbon stored in the reference approach. Consumption of fuels, which is expressed in terajoules (TJ) in the reference approach, will be reduced by the subtraction of non-energy use of fuel and feedstock from the reference approach. The ERT also noted that Slovakia has not appropriately referenced the allocation of coking coal for non-energy use and feedstock in CRF table 1.A(d) and the Party has excluded non-energy use and feedstock from the apparent consumption calculation of solid fuel in the reference approach. The ERT recommends that Slovakia revisit the reallocation of the non-energy use of coking coal in both the energy balance and the CRF tables.

22. The ERT reiterates the recommendations made in the previous review report that Slovakia work closely with the Statistical Office of the Slovak Republic, to examine and reduce these significant discrepancies, implementing actions towards the harmonization of data and ensuring that the NEIS data coverage is fully consistent with the national energy statistics. The ERT also recommends that the Party provide adequate and complete explanations in the NIR for any changes undertaken (see para. 18 above and para. 26 below).

23. The ERT identified some inconsistencies between the information provided in the CRF tables and information submitted to the International Energy Agency (IEA). For example, the total apparent consumption of liquid fuels reported to the UNFCCC by Slovakia corresponds with that reported to the IEA, with discrepancies within 2 per cent for all years except 2000, where the data in the CRF tables are approximately 4.5 per cent lower than those of the IEA and 2008–2010 where the data in the CRF tables are about 5 per cent higher. The growth rate in the period 1990–2011 for the total apparent consumption is 36 per cent in the CRF tables compared with 32 per cent in the IEA data. In addition, for dry natural gas, the values in the CRF tables for 1990 and 1991 are respectively 4.85 per cent and 10.9 per cent higher than the information submitted to the IEA. In response to questions raised by the ERT during the review, Slovakia indicated that the Statistical Office of Slovakia provides information based on gross calorific value

(GCV) and therefore consumption data in the IEA statistics are lower by the coefficient 1.11 following recalculation to correct for the difference in units, therefore no differences were found between IEA, the reference approach and the Statistical Office of the Slovak Republic data. The ERT recommends that Slovakia explain in the NIR any discrepancies regarding the apparent consumption data reported in its inventory to the UNFCCC, the data from the energy balance of the Statistical Office of the Slovak Republic and the data reported to IEA.

International bunker fuels

24. Despite recommendations made in the previous review report, Slovakia has not provided in the NIR adequate information on or explanations of the basis of the expert judgement used for the emission estimates for aviation bunkers. This expert judgement relates to the consumption of jet kerosene in the period 1990–2008, which assumes that the international aviation bunker represents 90.0 per cent on average of the total consumption at Slovak airports (domestic and international flights), while for the period 2009–2010 this share has increased to 95.0 per cent on average. For aviation gasoline, Slovakia assumes that 10.0 per cent of the fuel sold at airports is used for international flights for the whole period. The ERT strongly recommends that Slovakia provide this information in the NIR and further reiterates the recommendation made in the previous review report that Slovakia investigate the representativeness of the assumed time-trends of fuel consumption share between aviation and the international bunker throughout the entire time series.

Feedstocks and non-energy use of fuels

25. The previous review report indicated that the quantity of natural gas used as feedstock in ammonia production was reported as "NO" in CRF table 1.A(d) for the period 2002–2004 and Slovakia indicated that it would consider filling this gap on the basis of the data provided by the ammonia producer. The ERT noted that in the 2013 annual submission the issue was not addressed and resolved. The ERT reiterates the recommendation made in the previous review report that Slovakia make the necessary effort to fill this gap.

3. Key categories

Stationary combustion: liquid, solid and gaseous fuels – CO_2, CH_4 and N_2O[4]

26. Slovakia estimated GHG emissions from stationary combustion using data collected in the NEIS database. The NIR states that the data on total fuel use from the NEIS database correspond with the national statistics; however, a comparison of the data has not been included in the NIR. The ERT also noted that AD collected in the NEIS database were not compared to the data available in the national energy consumption statistics of the Statistical Office of the Slovak Republic and those reported to the international organizations, as recommended by the IPCC good practice guidance. This may explain the differences between the sectoral and reference approach estimates of the emissions from fuel combustion (see paras. 18 and 21 above). The ERT recommends that the Party implement the necessary verification actions to assess the consistency of information between the NEIS database and the data from the Statistical Office of the Slovak Republic and revise the AD of the inventory using the more accurate data.

27. The previous review report noted that the reporting of CO_2 and non-CO_2 emissions under this subcategory was inconsistent because of the use of different AD. The current ERT did not notice any change in the reporting in the NIR. Therefore, the ERT reiterates the recommendations in the previous review report: that Slovakia reconsider its reporting so

[4] Not all emissions related to all gases under this category are key categories, particularly CH_4 and N_2O emissions. However, since the calculation procedures for issues related to this category are discussed as a whole, the individual gases are not assessed in separate sections.

that CO_2, CH_4 and N_2O emissions under petroleum refining are reported in a consistent manner with CO_2 emissions in accordance with the IPCC good practice guidance; and that the Party improve transparency regarding the description of the carbon balance and the estimation and allocation of the associated CO_2 emissions in the NIR.

Road transportation: liquid fuels – N_2O

28. The ERT noted several fluctuations in the trends of annual implied emission factors (IEFs) in the period 1990–2011 which are not sufficiently explained or justified in the NIR. For example, the ERT noted changes in the IEF for N_2O: 0.99 kg/TJ in 1994 to 0.32kg/TJ in 2011 for gasoline; as well as for diesel oil 0.12 kg/TJ in 2011, which is 16.8 per cent higher than the 1990 value (0.14 kg/TJ), but it is 134.9 per cent higher than the minimum value reported in the time-series (0.05 kg/TJ in 2000). The ERT recommends that the Party explain these trends to enhance the transparency of its reporting.

C. Industrial processes and solvent and other product use

1. Sector overview

29. In 2011, emissions from the industrial processes sector amounted to 8,248.22 Gg CO_2 eq, or 18.2 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 170.54 Gg CO_2 eq, or 0.4 per cent of total GHG emissions. Since 1990, emissions have decreased by 13.6 per cent in the industrial processes sector, and increased by 15.9 per cent in the solvent and other product use sector. The key drivers for the fall in emissions in the industrial processes sector are the decreases of production rates of cement, metals and ammonia observed in the same period; and the increase in the use of emissions abatement technologies, which led to a reduction in emissions from nitric acid production. Within the industrial processes sector, 44.5 per cent of emissions were from metal production, followed by 32.5 per cent from mineral products and 17.5 per cent from chemical industry. The remaining 5.6 per cent were from consumption of halocarbons and SF_6.

30. The inventory is complete for the industrial processes sector and the AD, EFs and methodologies used in the industrial processes sector are consistent with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. Slovakia has followed all the recommendations made in the 2011 review report. The ERT commends Slovakia for its efforts and the improvement in the Party's inventory for the industrial processes sector.

31. The ERT noted that the Party explained in its NIR that the notation key "NA" (not applicable) was used to report emissions from several categories: CO_2 emissions from asphalt roofing; CO_2 emissions from road paving with asphalt; and CH_4 and N_2O emissions from glass production. For these categories there are no methodologies or default EFs available in the Revised 1996 IPCC Guidelines or the IPCC good practice guidance. The ERT considers that notation key "NE" should be used with an explanation about the lack of methodologies and/or EFs provided in the NIR and CRF table 9(a). The ERT recommends that Slovakia clarify whether these emissions occur and use the appropriate notation key to enhance the transparency of its reporting.

2. Key categories

Iron and steel production – CO_2

32. Slovakia reported a CO_2 IEF for iron and steel production that is low in comparison with the default value from the Revised 1996 IPCC Guidelines (0.8 t CO_2/t of steel produced versus the default value of 1.6 t CO_2/t for steel produced). In its NIR and in response to questions raised by the ERT during the review, Slovakia explained that it

applied a carbon balance methodology (while the IPCC Guidelines use a material balance) based on data obtained from the European Union Emissions Trading System (EU ETS) to estimate emissions from iron and steel production. Thus, it is possible to distinguish technology-related and energy-related carbon emissions and report them separately under the corresponding categories. Consequently, the Party explained that the IEF reported under iron and steel production reflects the process emissions. The ERT commends the Party for undertaking this effort and encourages Slovakia to continue to perform a comparative analysis of results against emissions data obtained from the EU ETS.

Consumption of halocarbons and SF_6 – HFCs

33. Emissions from consumption of halocarbons and SF_6 are based on a comprehensive and extensive electronic data collection system in Slovakia covering annual amounts of substances handled by operators dealing with fluorinated gases (F-gases).

34. Following the recommendations made in the previous review report, Slovakia reported HFC emissions from refrigeration and air-conditioning equipment, foam blowing, fire extinguishers, aerosols/metered dose inhalers and electrical equipment by contributing components: stocks, new fillings and disposal. The methodology is transparently described in the NIR, and AD and EFs are provided in the CRF tables. The ERT commends Slovakia for the efforts undertaken to enhance the transparency of the inventory. The ERT encourages the Party to continue to estimate and report these emissions in this manner, and to include descriptions of any further improvements to the applied methodology in the NIR.

35. The ERT encourages Slovakia to correct the overestimate of emissions identified in the previous review report: emissions of HFC-32 are double counted in CRF table 2(II), while CRF table 2(II).F provides the correct estimate.

3. Non-key categories

Calcium carbide production and use – CO_2

36. Slovakia has reported in its NIR (p. 158, table 4.23) the production and export AD used to estimate CO_2 emissions from calcium carbide use. The ERT noted that the NIR does not include any information on whether calcium carbide was imported. In response to a question raised by the ERT during the review regarding the import of calcium carbide, Slovakia explained that calcium carbide is not imported to the country and that emissions from calcium carbide use are accurately reported and not underestimated. The ERT accepts Slovakia's response but recommends that Slovakia include this explanation in its NIR.

D. Agriculture

1. Sector overview

37. In 2011, emissions from the agriculture sector amounted to 3,117.52 Gg CO_2 eq, or 6.9 per cent of total GHG emissions. Since 1990, emissions have decreased by 56.2 per cent. The key drivers for the fall in emissions are mainly the reduction in livestock numbers, particularly cattle, restricted use of fertilizers and new procedures in cattle stabling and animal waste management systems (AWMS). Within the sector, 57.2 per cent of the emissions were from agriculture soils, followed by 27.5 per cent from enteric fermentation and 15.3 per cent from manure management. Emissions from rice cultivation, prescribed burning of savannas and field burning of agricultural residues were reported as "NO".

38. Slovakia improved its QA/QC system: an independent expert was contracted by SHMU to act as verifier and consultant for independent verification procedures. The ERT commends the Party for the improvements made in the QA/QC system.

2. Key categories

Enteric fermentation – CH_4

39. Slovakia has reported in tables 6.4 and 6.5 of the NIR that EFs are based on average gross energy intake (GE) and other parameters are specific to the country. However, the NIR does not provide a detailed explanation on how GE estimates are used. Dairy and non-dairy cattle show different trends (NIR tables 6.3 and 6.5): until 2007, for non-dairy cattle the overall trend of GE was increasing, but as of 2008 the trend shows decreasing values leading to a decrease in IEFs. Since 2008 the trend of GE was always increasing for dairy cattle. In response to a question raised by the ERT during the review, the Party explained that the inventory uses weighted averages across subcategories of non-dairy cattle and also regions, and the overall trend of animal numbers in the south-western part of the country (where production costs are higher and animal production is more advanced) is decreasing compared with animal numbers in the north-eastern part of Slovakia. The ERT considers the response satisfactory and recommends that the Party include the explanation about these regional discrepancies and implications in trends in GE in the NIR.

Agricultural soils – N_2O

40. In the NIR (p. 219), the methodology for estimating N_2O emissions in agriculture soils from nitrogen-fixing (N-fixing) crops in not transparently reported by Slovakia. In paragraph 6.6.4.1 of the NIR (p. 219) the Party states that there are "enough reasons to accept an experimental value of 26 kg N/ha". The ERT found that this statement is not sufficient to support the country-specific value, since cropping area and the composition in terms of N-fixing crops has changed since the time when the experimental value was determined, and because the methodology used by Slovakia does not use the default value provided in the Revised 1996 IPCC Guidelines (table 4-7 and equation 5), which is related to total production and not to area. In response to questions raised by the ERT during the review regarding this issue, the Party explained that the methodology for the calculation of both N-fixing crops and crop residues is based on the measured and verified values of the nutritional potential of residual crops in soil, and that the value 26 kg N/ha is an average value for biological fixation and was not used in actual emissions calculations. The ERT reviewed the references provided by Slovakia and agrees that the methodology is accurate. However, in order to improve transparency in regard to the estimation of N_2O emissions from this category, the ERT recommends that the Party explain its country-specific methodology in the NIR, especially with regard to the calculation of emissions from N-fixing crops and crop residues. Moreover, the ERT recommends that the Party remove the sentence ". enough reasons to accept an experimental value of 26 kg N/ha" from the NIR, because it is misleading.

3. Non-key categories

Manure management – CH_4

41. In table 6.10 of the NIR, the Party presents information on the EF values for dairy and non-dairy cattle (4 kg/head/year and 3.8 kg/head/year, respectively). These factors are country specific and are lower than the IPCC default values for Eastern Europe (6 kg/head/year and 4 kg/head/year, respectively). In response to a question raised by the ERT during the review, Slovakia explained that the country-specific CH_4 EFs for dairy and non-dairy cattle for manure management were based and calculated in a manner consistent with the tier 2 methodology for enteric fermentation. Country and regionally specific input

parameters were used. These parameters (volatile solids (VS) and methane conversion factors (MCFs)) vary according to agro-climatic conditions in the country. The Party provided additional documentation concerning the definition of agro-climatic zones in Slovakia as well as an example of the calculation of the EFs according to different regions of the country. The ERT noted that the documentation shows that there is a tendency for a warmer climate in Slovakia. This is inconsistent with the Party's EFs, which are lower (in some regions) than the lowest value attributed to cool climates (table 4.6 in the Revised 1996 IPCC Guidelines – reference manual). Since the country-specific parameters resulted from expert judgement, and may result in an underestimate of emissions, the ERT strongly recommends that the Party enhance the reference for the expert estimation of these country-specific parameters in relation to the definition of agro-climatic zones and in relation to the allocation of AD in each climatic zone.

E. Land use, land-use change and forestry

1. Sector overview

42. In 2011, net removals from the LULUCF sector amounted to 7,467.26 Gg CO_2 eq. Since 1990, net removals have decreased by 25.5 per cent. The key driver for the fall in removals was natural disturbance events (storms in 2004 and bark beetle), which resulted in increased salvage harvesting. Within the sector, 6,540.79 Gg of net removals were from forest land, followed by 744.90 Gg of net removals from cropland and 384.27 Gg of removals from grassland. Other land accounted for net emissions of 121.68 Gg and settlements accounted for net emissions of 81.02 Gg. Emissions and removals from wetlands were reported as "NO".

43. The Party has made significant recalculations for the LULUCF sector between the 2012 and 2013 annual submissions in response to the recommendations made in the previous review report. The main reason for the recalculations is the application of new national biomass expansion factors (BEFs): BEF_1 for the conversion of merchantable increment to total above-ground increment; and BEF_2 for the conversion of merchantable volume to total above-ground volume. The impact of these recalculations on the LULUCF sector was an increase in removals of 13.6 per cent for 2010, and this affected all land uses.

44. Slovakia's reporting for the LULUCF sector is complete and no category or pool is reported as "NE". However, the ERT noted that some carbon pools for which reporting is mandatory were reported as "NO" following a tier 1 approach (e.g. dead organic matter and soil carbon in forest land remaining forest land). However, Slovakia stated in the NIR that carbon stock changes in these pools were assumed to be zero because, even though these pools are key categories, there were insufficient data available to apply a tier 2 approach. Therefore, noting that for key categories the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) recommends the use of higher-tier methods, the ERT recommends that the Party continue the on-going technical research (the "Assessment and modelling of carbon stocks in forest ecosystems for GHG inventory in landscape", known as the C-FORLAND project) in order to provide reliable data for estimating carbon stock changes in dead organic matter and soil carbon.

45. The ERT commends Slovakia for having implemented some of the recommendations made in the previous review report, in particular by having improved the transparency in the NIR, by:

(a) Providing national forest harvest statistics (coniferous and broadleaved trees) in Slovakia in 1990–2011, which is key information to estimate biomass losses;

(b) Reporting N_2O emissions from soil disturbance associated with land-use conversion to cropland for the first time (but see para. 83below);

(c) Providing justification that changes in carbon stocks from peatlands are not included in estimates, by explaining that the current area of peatlands is small (2,773 ha)[5] and it includes areas in strictly protected areas without active management;

(d) Providing justification that non-CO_2 emissions from drainage of soils and wetlands are not included in estimates by explaining that wet forest soils are classified as peatlands in Slovakia and therefore included under strictly protected areas without active management;

(e) Providing additional information for uncertainty values in some land-use subcategories;

(f) Providing information on the QA/QC procedures conducted for the LULUCF sector.

46. The ERT also commends Slovakia for its efforts in implementing recommendations made in the previous review report regarding its 2013 annual submission by providing in its NIR explanations on the planned improvements, such as the C-FORLAND research project, approved by the Slovak Research and Development Agency and to be undertaken by the National Forest Centre and Soil Science and Conservation Research Institute (VUPOP), which is expected to provide new data for all components of forest ecosystems (above-ground and below-ground biomass, deadwood, litter, soil) for the 2014 annual submission. The ERT strongly recommends that the Party report any recalculations in a transparent manner in the NIR and provide all updated information on AD, EFs and methodologies, explaining where these depart from the current methodologies.

47. However, Slovakia has not yet provided in its NIR information to support its assumption that lime application and N fertilization in forests in the country is not practised. During the review, in response to questions raised by the ERT, the Party clarified that some experiments with liming or N fertilization of forests were carried out in the past but these did not result in the expected effects in view of the high cost. On the basis of these results, Slovakia concluded that these activities do not occur as a management practices for forests. The ERT recommends that the Party provide these explanations and evidence in the NIR.

48. The previous review report identified several problems with the uncertainty analysis for the LULUCF sector.[6] During the review, in response to questions raised by the ERT, Slovakia clarified that it has prepared a tier 1 uncertainty analysis using default values on uncertainty from the IPCC good practice guidance for LULUCF, and that currently there is not enough supporting information or national studies in this area to justify the use of national data on uncertainty. The ERT reiterates the recommendation made in previous review reports that the Party conduct the tier 1 uncertainty analyses at the land-use subcategory level. The ERT also encourages the Party to continue the technical work to increase the transparency of its reporting by providing, in its next annual submission, country-specific uncertainty values at the land-use subcategory level for a tier 2 uncertainty analysis.

49. Slovakia has reported net carbon stock changes in mineral soils using a tier 2 method and country-specific mean values of soil organic carbon (SOC) stocks in mineral soils for each land-use category. The country-specific values were based on existing data sets from soil inventories and published information.[7] The ERT concluded that the process

[5] Stanová et al., 2000.
[6] FCCC/ARR/2012/SVK, paragraph 115.
[7] Šály 1998, Kobza et al. 1997, and 2002, Pavlenda 2008

of calculating the mean value of SOC stocks is not transparently described in the NIR. During the review, in response to questions raised by the ERT, the Party clarified that it calculated the mean value of the carbon stocks in mineral soils for each land-use category using existing published data and soil databases (forest monitoring system, survey of agricultural soils, soil pits on research plots and so on) including also information on land use for each plot. The first step in the procedure was the calculation of soil carbon stock at point level (survey plot level) to the same soil depth (to default soil depth – except for very shallow soils where the real maximum soil depth is the absolute limit) in order to obtain primary values of SOC for comparable (standard) soil depth. As a second step, the mean values of SOC for each land-use category were derived from existing data sets on average, if the respective data sets from systematic surveys was representative, or as weighted averages corresponding to the aerial structure of soil types at country level. The ERT is of the view that the process of estimating the mean value of SOC stocks is appropriate, but that it is not clearly and transparently described in the NIR. Therefore, the ERT recommends that the Party improve the transparency of its reporting by providing a clear description of the process to estimate the mean value of SOC stocks in each land-use category and refer to the original data source (e.g. number of sample plots for each land-use category and the aerial structure of soil types at country level).

50. Slovakia has reported average annual changes of SOC for different types of land-use conversion in its NIR (sections 7.7.4, 7.8.4, 7.9.3, 7.11.3 and 7.12.3). However, the values are reported without the use of plus or minus signs. During the review, in response to questions raised by the ERT, the Party clarified that even though only absolute values are available in the NIR, plus/minus values were used correctly in the calculations. The ERT recommends that the Party improve the transparency of its reporting by including in the NIR a matrix on average annual changes of SOC over the length of transition period for different types of land-use conversion using plus/minus signs, as appropriate.

2. Key categories

Forest land – CO_2

51. As referred to in the previous review report, sources of AD and EFs for LULUCF are not always transparently reported in its NIR, in particular, for the annual growth rate for individual forest tree species. During the review, in response to questions raised by the ERT, Slovakia clarified that the annual growth rate for individual tree species expressed as current annual increment (CAI) was determined based on the average stocks in the different age levels for individual tree species (i.e. the sum of the average increment in the different age levels, expressed per unit of actual area of the existing tree species). In Slovakia, CAI values have traditionally been calculated by the National Forest Centre – Institute for Forest Resources and Information (NFC IFRI Zvolen) (forest management plan database administrator). The ERT is of the view that the process to calculate CAI is appropriate, but it is not transparently described in the NIR. Therefore, the ERT recommends that the Party improve the transparency by providing a clear description of the process used to determine CAI, for example by showing the data table on the area of each stratified site, site quality and age class of the existing tree species.

52. Slovakia has reported in its NIR (page 245) that the annual harvest volume (H) is collected and elaborated by the NFC IFRI Zvolen, on the basis of about 9,000 respondents (forest owners). This represents 90–95 per cent of annual harvest data and covers thinning and final cut. The ERT considers that the "5-10% of annual harvest data" which was not reported might result in a potential underestimation of the emissions from biomass loss due to harvesting. During the review, in response to questions raised by the ERT, the Party clarified that after repeated consultation with experts from NFC IFRI Zvolen it could confirm that annual reported harvest data covers the whole biomass harvested including all

the biggest forest companies, forest owners or users in Slovak forests during the reported year. The Party added that even the stolen timber is notified by owners and it is included in the annual harvest data each year. All subjects (users, companies), whether or not they are involved in harvesting, have to inform NFC IFRI Zvolen, in accordance with statutory duty (Act No. 326/2005 on forests), about the amount and type of harvest. Although Slovakia recognized that there still exists a small percentage of owners who do not inform the NFC IFRI Zvolen, these did not harvest. Thus, illegal harvest is an almost impossible event in Slovak forests. The ERT recommends that the Party include the provided explanation in the NIR.

53. Slovakia has used BEF_2 for breeding poplar and willow, which is reported as lower than 1.0 in its NIR (table 7.6). The ERT considers that this value is not in accordance with table 3A.1.10 of the IPCC good practice guidance for LULUCF. During the review, in response to questions raised by the ERT, Slovakia clarified that this is a technical error and that the correct BEF_2 for breeding poplar and willow is 1.30. The ERT considers that the revised value is appropriate. The ERT recommends that the Party provide the revised BEF_2 value in its NIR.

54. The ERT commends Slovakia for having used disaggregated country-specific values of basic wood density (WD) and BEF_1 and BEF_2 for estimating the increase of carbon stocks in above-ground biomass, following a recommendation made in the previous review report. However, the Party used the aggregated country-specific values of biomass conversion and expansion factors (BCEFs) for estimating the decrease of carbon stocks. The ERT considers that this is inconsistent and could lead to a potential underestimation of emissions. During the review, in response to questions raised by the ERT, Slovakia explained that "new BEF" for increase of carbon stocks (BEF_1) as well as the decrease of carbon stocks (BEF_2) were derived and calculated for the latest annual submission in order to improve transparency and accuracy. The aggregated country-specific values of BCEFs were used because the Party plans to use them in the future annual submissions, when the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) will be used. The ERT notes that, in accordance with the UNFCCC reporting guidelines, Annex I Parties may use their own national EF and AD, where available, provided that: they are developed in a manner consistent with the IPCC good practice guidance for LULUCF; they are considered to be more accurate; and the use is reported transparently. The ERT recommends that the Party justify in the NIR of its next annual submission its use of methodologies from the 2006 IPCC Guidelines in terms of the IPCC good practice guidance for LULUCF and country-specific circumstances. Therefore, the ERT also recommends that the Party improve the transparency of its reporting by providing a clear description of the process of aggregation of the BCEFs, in particular by providing a data table on the disaggregated WD, BEF_1/BEF_2 and aggregated BCEFs for the tree species/cohorts in its annual submission.

Forest land remaining forest land – CO_2

55. Slovakia used equation 3.2.7 of the IPCC good practice guidance for LULUCF to estimate the annual carbon loss due to commercial felling for forest land remaining forest land. The Party used the default value (0.1) from table 3A.1.11of the IPCC good practice guidance for LULUCF for the fraction of biomass left to decay in forest (f_{BL}). However, the ERT noted that this is not in accordance with section 3.2.1.1 of the IPCC good practice guidance for LULUCF. During the review, in response to questions raised by the ERT, the Party explained that the default value (0.1) for f_{BL} was chosen because the Party does not have empirical data. The Party explained that it is common practice that a "certain part" of the harvest remains in the Slovak forests in the dead organic matter (DOM) pool. The ERT considers that, since the Party uses a tier 1 approach to report carbon stock changes in the DOM, it does not account for the increase/decrease of carbon stocks in the DOM pool due

to input of the harvesting residues. Therefore, the ERT recommends that the Party use the methodology in equation 3.2.7 of the IPCC good practice guidance for LULUCF, under which f_{BL} should be set to 0, or estimate carbon soil changes for DOM using a tier 2 methodology.

Cropland remaining cropland – CO_2

56. The overall trend of CO_2 net removals is quite stable, being the 2011 value (–918.20 Gg), 3.9 per cent higher than the 1990 value (–955.44 Gg), and this trend mostly follows the trend of the pool living biomass, which is also quite stable. However, the ERT noted that the trend of carbon stock changes in soils for this category is not consistent with the trend of the area for this category. In particular, for the pool mineral soils, the overall trend of the carbon stock change IEF is increasing and the 2011 value (0.008 Mg C/ha) is 636.0 per cent higher than the 1990 value (0.001 Mg C/ha). Furthermore, the following significant inter-annual changes have been identified: 2002/03 (38.5 per cent), 2003/04 (119.4 per cent), 2005/06 (120.5 per cent), 2006/07 (–55.2 per cent), 2007/09 (26.0 per cent), 2009/10 (158.8 per cent) and 2010/11 (–26.7 per cent).

57. The ERT considers that the information provided in the NIR (section 7.8.4.1) is not sufficient to understand the inter-annual variations, and in particular the spikes occurring in 2006 and 2010. During the review, in response to questions raised by the ERT, Slovakia explained that the method used to estimate carbon stock changes in mineral soils for this category is in accordance with section 3.3.1.2 of the IPCC good practice guidance for LULUCF, using equation 3.3.3 with default relative stock change factors from table 3.3.4 and country-specific values of average soil carbon stocks for cropland. It also explained that the spikes occurring in 2006 and 2010 are related to the percentage of the no-tillage cropland area. The annual values of the no-tillage area were obtained from the Statistical Office of Slovak Republic.[8] The percentage of the no-tillage cropland area was stable from 1990–2001 (0.25 per cent), or ranged from 0.26 to 0.97 per cent between 2002–2011, except for the years 2006 (1.83 per cent), 2010 (2.51 per cent) and 2011 (1.84 per cent). The values of the no-tillage cropland area range from 3.7 kha to 14.7 kha in individual years, except 2006 (27.8 kha), 2010 (37.9 kha) and 2011 (27.8 kha). Slovakia provided to the ERT the relevant AD in an Excel file. The ERT strongly recommends that the Party include the provided explanations and data in its annual submission.

58. Slovakia has reported in its NIR that it has used a tier 1 method to estimate the carbon stock changes in living biomass for cropland remaining cropland. The increase in living biomass is calculated with the default biomass accumulation rate for temperate perennial cropland (2.1 tonnes C/ha/year, from table 3.3.2 of the IPCC good practice guidance for LULUCF). The ERT considers that the way that the decrease in carbon stocks in living biomass is calculated (e.g. for the removal of perennial crops) is not transparently described in the NIR. During the review, in response to questions raised by the ERT, the Party explained that the decrease in carbon stocks was included in the calculation, and biomass loss was estimated by multiplying a default carbon stock value (63 tonnes C/ha) from table 3.3.2 of the IPCC good practice guidance for LULUCF by the area of cropland on which perennial woody crops were removed. The ERT recommends that the Party improve the transparency of its reporting by providing a clear description of the process of calculating decreases in carbon stocks in the living biomass pool for this category.

Land converted to grassland – CO_2

59. The ERT noted that the trend of carbon stock changes in living biomass for land converted to grassland is not stable and significant inter-annual changes have been identified, ranging from a 368.7 per cent decrease in 1991/92 to a 57.5 per cent increase in

[8] <www.portal.statistics.sk>.

1992/93. The information provided in its NIR (section 7.9.3.1) is not sufficient to understand the spike occurring in 1992. During the review, in response to questions raised by the ERT, Slovakia explained that the spike of living biomass occurring in 1992 is related to an increase of the area of cropland converted to grassland, given that in 1992, a large area of cropland (22.778 kha) were converted to grassland, in comparison with 1991 (2.22 kha) and 1993 (4.59 kha). The ERT recommends that the Party include the provided explanation in its annual submission.

60. Slovakia has reported the use of default biomass carbon stocks removed due to land conversion to grassland from cropland (5.0 tonnes C/ha) in its NIR (page 260). The ERT considers that the cropland converted to grassland could include not only annual crops but also perennial woody crops. During the review, in response to questions raised by the ERT, Slovakia explained that it believes that the calculation procedure is correct, as it is based on the IPCC good practice guidance for LULUCF. The IPCC good practice guidance for LULUCF (page 3.124) states that table 3.4.8 provides users with directions on where to find carbon stock values for C_{before} in land uses prior to clearing. In this table, default values for cropland prior to the conversion (5.0 tonnes C/ha) to grassland are recommended. The ERT recommends that the Party use default carbon stock values before conversion not only for the annual crops (5.0 tonnes C/ha) but also for the perennial woody crops, in accordance with the IPCC good practice guidance for LULUCF (table 3.3.2), for carbon stocks in a range of climate regions for generic perennial woody cropland and considering the area converted from annual crops and perennial woody crops, respectively.

3. Non-key categories

Land converted from grassland – CO_2

61. Slovakia has used default values for cold temperate climate – dry (6.5 tonnes dry matter/ha) from the 2006 IPCC Guidelines (table 6.4) to estimate total (above-ground and below-ground) non-woody biomass for grassland, prior to conversion, as reported in the NIR (page 257). The ERT noted that the Party should use default values for cold temperate climate – wet (13.6 tonnes dry matter/ha) since Slovakia is located in the climate zone of cold temperate – wet. During the review, in response to questions raised by the ERT, the Party explained that it will use the default values for this climate region (13.6 tonnes dry matter/ha) in its next annual submission. The ERT recommends that Slovakia implement this improvement in the accuracy of its inventory.

Biomass burning – CO_2, CH_4 and N_2O

62. Slovakia has reported both CO_2 and non-CO_2 emissions from controlled burning in CRF table 5(V). However, the ERT notes that, as mentioned in its NIR (page 249), controlled burning in Slovakia is only used for post-logging burning of harvest residues, not for fire control purposes. The ERT also notes that, under the tier 1 approach, total biomass associated with the volume of the extracted roundwood, including harvest residues, should be considered as an immediate emission (i.e. lost upon harvesting). Therefore, the ERT recommends that, under the tier 1 approach, the Party include CO_2 emissions from controlled burning in the total biomass loss associated with harvesting in CRF table 5.A.1. and not included these emissions in CRF table 5(V) in order to avoid double counting.

63. Slovakia has reported in its NIR (page 249) that the harvesting system in Slovakia is characterized by burning harvesting residues. The harvesting residues are burned on about half of the forest clearing area, but some differences in the quantity of burning biomass occur among species: for coniferous species 10 per cent of biomass is burned, while for broadleaved trees about 25 per cent of biomass is burned. In addition to harvesting residue burning, CO_2 emissions released from wild forest fires were included in the estimates. The emissions from burning of biomass residues were estimated according to equation 3.2.19 of

the IPCC good practice guidance for LULUCF. However, the ERT noted that sources of the AD (annual loss of biomass) and the EFs (fraction of biomass burned on site (coniferous (0.03) and broadleaves (0.05) for controlled burning and (1.00) for forest fires) and the fraction of biomass oxidized on site (0.9)), as reported in the NIR (table 7.9), are not transparently provided. The ERT considers that this might be a potential underestimation of emissions.

64. During the review, in response to questions raised by the ERT, the Party explained that the fraction of biomass burned on site is the result of multiplying the percentage of harvesting residues (10 per cent for coniferous and 20 per cent for broadleaves) by the percentage of the area where residues are burned (30 per cent for conifers and 20 per cent for broadleaves). The fraction of biomass oxidized on site, which is the fraction of burned biomass that actually oxidizes instead of turning to charcoal, uses default values from the Revised 1996 IPCC Guidelines (workbook, page 5.15). The ERT considers that the aggregated values of those EFs are lower than the combustion factor values for temperate forest in table 3A.1.12 of the IPCC good practice guidance for LULUCF and the source of AD (annual loss of biomass) and EFs (fraction of biomass burned on site) are not transparently described in the NIR. Therefore, the ERT recommends that Slovakia improve the transparency of its reporting by providing separately a clear description of the process used to determine the annual loss of biomass (e.g. the actual area and above-ground biomass subject to biomass burning) and the fraction of biomass burned on site (e.g. related references) from controlled burning and wild fires.

F. Waste

1. Sector overview

65. In 2011, emissions from the waste sector amounted to 2,227.32 Gg CO_2 eq, or 4.9 per cent of total GHG emissions. Since 1990, emissions have increased by 104.1 per cent. The key drivers for the rise in emissions were the changes in management of solid waste. Within the sector, 70.6 per cent of the emissions were from solid waste disposal on land, followed by 19.3 per cent from wastewater handling, and 9.5 per cent from other (waste). The remaining 0.5 per cent were from waste incineration.

66. The inventory for the waste sector is complete in terms of gases and categories, and includes all of the required information on uncertainties, QA/QC procedures and planned inventory improvements.

67. The ERT noted that Slovakia has included a significant amount of country-specific data in its 2013 annual submission. The ERT encourages Slovakia to update the plan to improve the accuracy of estimates, in particular for the wastewater handling subcategories.

2. Key categories

Solid waste disposal on land – CH_4

68. Slovakia used a tier 2, first-order decay (FOD) method to estimate CH_4 emissions from solid waste disposal sites (SWDS). Default parameters and AD were generally provided in the NIR. As already identified in the previous review report, the ERT noted that the Party has transposed the values reported in CRF table 6.A for degradable organic carbon (DOC) and the fraction of DOC in municipal solid waste (MSW). In response to questions raised by the ERT during the review, Slovakia explained that it will correct this in the next annual submission, and the ERT reiterates the recommendation made in the previous review report that the Party do so.

69. Slovakia calculated the emissions from the agricultural and industrial waste fractions using default values from the 2006 IPCC Guidelines. The Party justifies the use of these values based on the fact that the political, technological and economic changes that have affected the country since 1990 mean that applying the tier 1 approach from the IPCC good practice guidance would not be sufficiently accurate. CH_4 emissions for the period 1990–2006 were reported as equal as those of 1997 because before that year no data were available. The ERT recommends that the Party include the emissions for the period 1990–1996 using an interpolation method in accordance with the IPCC good practice guidance and, reiterating recommendations made in previous review reports, recommends that the Party include more transparent information on industrial and agricultural waste composition.

Wastewater handling – CH_4 and N_2O[9]

70. CH_4 emissions were estimated for domestic/commercial and industrial categories. Country-specific data of biochemical oxygen demand (BOD) and chemical oxygen demand (COD) from the Department of Water Quality of SHMU were used as AD. Slovakia provided the rationale for the choice of methods and national EFs used for each wastewater handling pathway. The ERT considers that the reporting of these emission estimates is made in a transparent manner and is in accordance with the IPCC good practice guidance.

71. The stabilization of sewage sludge is an integral part of wastewater treatment plants in Slovakia, and this process is carried out in sludge tanks under anaerobic conditions. The Party informed the ERT that all gas is collected and used and no emissions result. The ERT recommends that the Party include estimates of these emissions or provide documentation that emissions do not occur.

72. N_2O emissions from wastewater handling were estimated for domestic, commercial and industrial wastewater and from human sewage. Slovakia used methodologies and EFs from the 2006 IPCC Guidelines or advanced centralized wastewater treatment plants. N_2O emissions from domestic, commercial and industrial wastewater showed decreasing trends for the period 1990–2010, explained by the decrease of industrial production and the decrease of the treated effluent.

3. Non-key categories

Other – CH_4 and N_2O

73. CH_4 and N_2O emissions from composting of MSW and industrial waste were estimated using a tier 1 approach, default IPCC values and back-extrapolation to 1990. The ERT commends Slovakia for its efforts in the reporting these emissions and recommends that the Party make efforts to improve the consistency of the emissions trend in accordance with the IPCC good practice guidance.

G. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

1. Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Overview

74. Table 6 provides an overview of the information reported and parameters selected by the Party under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

[9] Not all emissions related to all gases under this category are key categories, particularly N_2O emissions. However, since the calculation procedures for issues related to this category are discussed as a whole, the individual gases are not assessed in separate sections.

Table 6
Supplementary information reported under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

		Findings and recommendations
Has the Party reported information in accordance with the requirements in paragraphs 5–9 of the annex to decision 15/CMP.1?	Sufficient	Slovakia has reported carbon stock changes in above-ground biomass, below-ground biomass, litter and soil organic carbon pools for land subject to afforestation/reforestation activities. Carbon stock changes in dead wood pool were reported as "NO". However, the Party has not provided in the NIR clear verifiable information that the unaccounted dead wood pool was not a net source of anthropogenic greenhouse gas emissions, in accordance with the annex to decision 15/CMP.1 para. 6(e) (see para. 78 below)
Identify any elected activities under Article 3, paragraph 4, of the Kyoto Protocol	Activities elected: None Years reported: None	
Identify the period of accounting	Commitment period accounting	
Assessment of the Party's ability to identify areas of land and areas of land-use change	Sufficient	

Abbreviations: NIR = national inventory report, NO = not occurring.

Activities under Article 3, paragraph 3, of the Kyoto Protocol

Afforestation and reforestation – CO_2, CH_4 and N_2O

75. Slovakia reported values for the annual biomass increments in table 7.6 of the NIR (page 244). The values, especially for the four main tree species (spruce 3.74 t dry matter/ha/year, pine 4.23 t dry matter/ha/year, beech 4.84 t dry matter/ha/year, oak 4.07 t dry matter/ha/year), are different from those reported in section 11.3.1.1 of the NIR regarding KP-LULUCF activities (page 313) (spruce 2.74 t dry matter/ha/year, pine 3.17 t dry matter/ha/year, beech 2.32 t dry matter/ha/year, oak 1.23 t dry matter/ha/year). During the review, in response to questions raised by the ERT, the Party explained that the values for the four main tree species in table 7.6 of the NIR are different because these data represent the whole living biomass (above- as well as below-ground), while those reported in section 11.3.1.1 of the NIR represent only the above-ground biomass. However, the ERT notes that the Party reported the values of whole living biomass (above- as well as below-ground) in table 7.6 in its NIR (spruce 4.49 t dry matter/ha/year, pine 5.07 t dry matter/ha/year, beech 5.81 t dry matter/ha/year, oak 4.88 t dry matter/ha/year) and above-ground biomass increments are also reported in the same table (under the title of "annual biomass increment") for the four main tree species, and these values are also higher than those reported in section 11.3.1.1 of the NIR. The ERT strongly recommends that the Party improve the transparency and consistency of the values of above-ground biomass increment reported in the NIR, and provide the information data sources for the values used.

76. Slovakia does not account for biomass losses from harvest in areas under afforestation and reforestation (A/R) with the justification that thinning does not occur before the stand reaches 40 years of age in Slovakia. The ERT notes that this age is an uncommonly old age compared with other European countries. During the previous review,

the Party clarified that harvest does not occur before the stand reaches the age of 40, but "cleaning" does occur. However, data are only available on the area subject to cleaning every year, not on the volume of wood felled during these cleanings. The ERT considers that failing to estimate the volume of wood lost from these cleanings is a potential cause of underestimation of emissions. Therefore, the ERT strongly reiterates the recommendation made in the previous review report that the Party provide an estimate of biomass loss from cleaning on A/R lands in the next annual submission.

77. Slovakia reports as "NO" several categories in table NIR-1 (e.g. direct N_2O emissions from N fertilization, N_2O emissions from drainage of soils, N_2O emissions from disturbance associated with land-use conversion to cropland and carbon emissions from lime application). However, many categories in table 5(KP), 5(KP-I) and 5(KP-II) were reported as "NA" (e.g. units of land harvested since the beginning of the commitment period and the same categories as listed above). During the review, in response to questions raised by the ERT, Slovakia explained that the notation key "NO" used in table NIR-1 will be corrected to "NA", as it is in tables 5(KP), 5(KP-I) and 5(KP-II). The ERT notes that some of the emissions reported as "NO" could represent potential underestimates (e.g. N_2O emissions from disturbance associated with land-use conversion to cropland and CH_4 and N_2O emissions from wildfires), and reiterates the recommendation made in the previous review report that Slovakia change the notation key from "NA" to "NO" or provide an estimate for these categories in the next annual submission.

78. Net carbon stock changes in dead wood under A/R activities are reported as "NO". Slovakia stated in the NIR that it considers that the dead wood pool is not a net source, as it is assumed that dead wood does not exist in A/R areas. During the review, in response to questions raised by the ERT, Slovakia clarified that the dead wood pool prior to the A/R action can be assumed to be zero as a default assumption, because the land-use categories of cropland, grassland, settlements and other lands do not contain significant amounts of dead wood. The ERT reiterates the recommendation made in the previous review report that the Party include the above explanations in the NIR of its next annual submission.

79. In table NIR-1 and CRF table 5(KP-II)5, Slovakia uses the notation key "NO" to report emissions from biomass burning for all activities under Article 3, paragraph 3, of the Kyoto Protocol. The ERT understands that controlled burning does not occur on these areas because controlled burning in the country is only used for post-logging burning of harvest residues, not for fire control purposes: therefore young stands are not subject to controlled burning. However, this information it is not clearly mentioned in the NIR. Furthermore, Slovakia did not provide information in the NIR showing that wildfires do not occur on these same areas. The ERT considers that this may result in a potential underestimation of emissions. During the review, in response to questions raised by the ERT, the Party clarified that the database of forest fires that is currently used for reporting biomass burning does not allow for estimates of biomass burning occurring on areas under afforestation/reforestation and deforestation, although a regulation of the Ministry of Agriculture (Regulation No. 297/2011 on forest management records) defines the activities which have to be reported by the owners or users within the Slovak territory. The ERT recommends that Slovakia provide, in its next annual submission, clear evidence that controlled burning and wildfires do not occur on areas under Article 3, paragraph 3, of the Kyoto Protocol. Otherwise, the ERT reiterates the recommendation made in the previous review report that the Party provide an estimate of emissions from wildfires on these areas in the next annual submission.

Deforestation – CO_2 and N_2O

80. Slovakia has made significant recalculations for its estimates of emissions from deforestation between the 2012 and 2013 annual submissions. The impact of the recalculations on the estimates for deforestation is a decrease in emissions of 23 per cent on

average. During the review, in response to questions raised by the ERT, the Party explained that the following changes in data and methods have been implemented since the previous annual submission, as described in its NIR (pages 316–317):

(a) The carbon stock changes in above-ground and below-ground biomass from deforestation were recalculated for the whole accounting period. The main reason for the recalculation was to increase the accuracy for carbon stocks. New BCEFs were developed based on the National Forestry Inventory (NFI) data. The following BCEFs were used: for conifers (0.70) and for broadleaves (1.20) in the 2012 annual submission and for conifers (0.65) and for broadleaves (0.84) in the 2013 annual submission. A new root-to-shoot ratio (R) was used for conifers (0.22) in the 2012 annual submission and (0.20) was used in the 2013 annual submission for the calculation of below-ground biomass stocks;

(b) The carbon stock changes in mineral soils from deforestation were recalculated for the whole accounting period. A new methodological approach of calculation was applied, taking into account the subsequent land-use category. Different values for each land-use conversion to cropland (2.446 Mg C/ha/year), to grassland (1.404 Mg C/ha/year), to settlements and other land (3.024 Mg C/ha/year) were used for the calculations in the 2013 annual submission, which represents an improvement in comparison to the constant value (3.024 Mg C/ha/year) that was used for all land-use categories converted from forest land in the 2012 annual submission.

81. The ERT commends Slovakia for the improvements made to the accuracy of the inventory. However, the ERT recommends that the Party improve the transparency of its reporting by providing, in its next annual submission, a clear description of the process of aggregation of the BCEFs by providing data table on the disaggregated WD, BEF_1/BEF_2 and aggregated BCEFs for the tree species/cohorts in the NIR.

82. Slovakia has used the default root-to-shoot ratios (R) for conifers (0.20) and for broadleaves (0.24) from the 2006 IPCC Guidelines (table 4.4) in order to estimate carbon stock changes in living biomass from deforestation. This is inconsistent with the reporting under the LULUCF sector, where R (0.20) is used for both conifers and broadleaves (table 7.6 in its NIR, page 244). During the review, in response to questions raised by the ERT, the Party explained that the default R (0.20) for the LULUCF sector reporting was selected as a conservative value from the range recommended for temperate-zone forests from the IPCC good practice guidance for LULUCF for calculation annual biomass increment. The default R (0.20) for conifers and (0.24) for broadleaves were selected as the most suitable values for deforestation. The ERT recommends that the Party improve the transparency of its reporting by providing, in its next annual submission, the relevant reference for determining R values in the LULUCF sector. In addition, the ERT encourages the Party to use consistent R values for its calculations of the annual biomass increment for its reporting under the LULUCF sector and the deforestation rate for KP-LULUCF activities in order to ensure consistency and accuracy. The ERT notes that, in accordance with the UNFCCC reporting guidelines, Annex I Parties may use their own national EF and AD, where available, provided that: they are developed in a manner consistent with the IPCC good practice guidance for LULUCF; they are considered to be more accurate; and the use is reported transparently. The ERT recommends that the Party justify, in the NIR of its next annual submission, its use of methodologies from the 2006 IPCC Guidelines in terms of the IPCC good practice guidance for LULUCF and country-specific circumstances.

83. Slovakia uses the notation key "NO" to report N_2O emissions from disturbance associated with land-use conversion to cropland in table NIR-1 and 5(KP-II)3. However, land converted to cropland was reported in CRF table 5.B for the period 2008–2011. The ERT concludes that emission estimates for KP-LULUCF activities are potentially underestimated for N_2O emissions. During the review, in response to questions raised by

the ERT, the Party explained that it plans to provide the calculation of N_2O emissions from disturbance associated with land-use conversion to cropland in the next annual submission. The ERT strongly reiterates the recommendation made in the previous review report that the Party provide an estimate of N_2O emissions from disturbance associated with land-use conversion to cropland in the next annual submission.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

84. Slovakia has reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. The ERT took note of the findings included in the standard independent assessment report (SIAR) on the SEF tables and the SEF comparison report.[10] The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the main findings contained in the SIAR.

85. Information on the accounting of Kyoto Protocol units has been prepared and reported in accordance with decision 15/CMP.1, annex, chapter I.E, and reported in accordance with decision 14/CMP.1 using the SEF tables. This information is consistent with that contained in the national registry and with the records of the international transaction log (ITL) and the clean development mechanism registry and meets the requirements referred to in decision 22/CMP.1, annex, paragraph 88(a–j). The transactions of Kyoto Protocol units initiated by the national registry are in accordance with the requirements of the annex to decision 5/CMP.1 and the annex to decision 13/CMP.1. No discrepancy has been identified by the ITL and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

Calculation of the commitment period reserve

86. Slovakia has reported its commitment period reserve in its 2013 annual submission. Slovakia reported its commitment period reserve to be 226,484,821 t CO_2 eq based on the national emissions in its most recently reviewed inventory (45,296.96 Gg CO_2 eq). The ERT agrees with this figure.

3. Changes to the national system

87. Slovakia reported that there are changes in its national system since the previous annual submission. The Party described in its NIR the changes that have been implemented in response to the review process, which mainly include the establishment of a special working group within the inter-ministerial coordination committee, the signing of an agreement with the Statistical Office of the Slovak Republic to ensure direct access to the relevant statistical information, agreements on cooperation between MoE and the Ministry of Agriculture and Rural Development regarding estimates for the LULUCF sector and with the Ministry of Transport, the transport research institute and SHMU to improve the emission estimates for road transport. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

4. Changes to the national registry

88. Slovakia reported that there are changes in its national registry since the previous annual submission. The Party described the changes, specifically due to the centralization

[10] The SEF comparison report is prepared by the international transaction log (ITL) administrator and provides information on the outcome of the comparison of data contained in the Party's SEF tables with corresponding records contained in the ITL.

of the EU ETS operations into a single EU registry operated by the European Commission called the Consolidated System of European Union Registries (CSEUR), in its NIR (see page 324). The CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

89. The ERT noted that there were recommendations in the SIAR related to CSEUR that had not been addressed, in particular recommendations related to the updating of publicly available information on the website, reporting a description of the changes in database structure and reporting of test results. In response to questions raised by the ERT during the review, Slovakia provided further information, some confidential, on the changes to the national registry, including information on the data model, reporting a description of the changes in database structure and reporting of test results.

90. The ERT concluded that, taking into account the confirmed changes in the national registry, and the additional information provided to the ERT during the review, Slovakia's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). With respect to the provision of information related to database structure specifically, the ERT encourages the Party to provide additional information in the NIR for its next annual submission. The ERT recommends that the Party include all other additional information in response to the SIAR findings in its NIR in accordance with decision 15/CMP.1, annex, chapter I.G.

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

91. Slovakia has reported on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol in the 2013 annual submission. The Party did not provide information on changes in its reporting. However, the ERT concluded that Slovakia did not include additional information or changes to the previous reporting on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The ERT recommends that Slovakia report on changes made as a result of changes to the previous reporting on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, in the next annual submission.

92. Slovakia explained that its integration into the EU provided incentives for the adoption of more environmentally sound technologies. Slovakia has fully privatized the former state owned mines and continues in granting the coal industry investment aid; as the Party does not export its coal to other countries, the Slovak economy has a minimal impact on the existing structure of international trade in terms of coal and pricing.

93. Regarding the Kyoto Protocol mechanisms, the Party states that no significant impact of the variation of emissions allowance prices on the oil consumption within the country is expected in the near future and the impact of the country on the world prices of biofuels is negligible. Slovakia states that more than 21 per cent of the projects relating to the foreign development policy of Slovakia focused on supporting the utilization of renewable energy resources and energy efficiency, and on adaptation measures, including the construction of early warning systems, adjustments and efficiency improvements of water management, as well as capacity-building and improvement in the infrastructure for compliance with the Convention and the Kyoto Protocol. The ERT considers that the information provided is complete and transparent.

III. Conclusions and recommendations

A. Conclusions

94. Table 7 summarizes the ERT's conclusions on the 2013 annual submission of Slovakia, in accordance with the Article 8 review guidelines.

Table 7
Expert review team's conclusions on the 2013 annual submission of Slovakia

		Paragraph cross-references
The ERT concludes that the inventory submission of Slovakia is complete (categories, gases, years and geographical boundaries and contains both an NIR and CRF tables for 1990–2011)		
Annex A sources[a]	Complete	
LULUCF[a]	Complete	
KP-LULUCF	Not complete	
The ERT concludes that the inventory submission of Slovakia has been prepared and reported in accordance with the UNFCCC reporting guidelines	Yes	Table 4, paras. 54, 82
The submission of information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1	Yes	Table 6, para. 78
The Party's inventory is in accordance with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*	Yes	27, 54, 82
Slovakia has reported information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol	Yes	Table 6, para. 76, 78, 82
Slovakia has reported information on its accounting of Kyoto Protocol units in accordance with decision 15/CMP.1, annex, chapter I.E, and used the required reporting format tables as specified by decision 14/CMP.1	Yes	
The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1	Yes	
The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions	Yes	
Did Slovakia provide information in the NIR on changes in its reporting of the minimization of adverse impacts in accordance	No	91

	Paragraph cross-references
with Article 3, paragraph 14, of the Kyoto Protocol?	

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, CRF = common reporting format, ERT = expert review team, IPCC = Intergovernmental Panel on Climate Change, KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, or the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*).

B. Recommendations

95. The ERT identified the issues for improvement listed in table 8. All recommendations are for the next annual submission, unless otherwise specified.

Table 8
Recommendations identified by the expert review team

Sector	*Category*	*Recommendation*	*Paragraph cross-reference*
Cross-cutting	QA/QC	Improve QA/QC procedures, especially for the energy, LULUCF and waste sector.	Table 3
	Transparency	Enhance the transparency of reporting for identified areas in all sectors	Table 3
		Increase the transparency of reporting regarding the key category analysis for KP-LULUCF activities	Table 4
	Uncertainty analysis	Report uncertainty values with and without LULUCF, in the NIR	Table 4
Energy	Completeness and transparency	Change the use of notation key from "NO" to "NE" for the category CO_2 emissions from coal mining and handling	17
	QA/QC	Include in the NIR a table presenting a comparison by fuel type, of fuel consumption data from the NEIS database and from the national statistics	18
	Comparison of the reference approach with the sectoral approach	Revisit the reallocation of the non-energy use of coking coal in both the energy balance and the CRF tables	21
		Work with the Statistical Office of the Slovak Republic to implement actions towards the harmonization of data and ensuring that the NEIS data coverage is fully consistent with the national energy statistics, and report on the actions made	22, 26

Sector	*Category*	*Recommendation*	*Paragraph cross-reference*
	Comparison to international statistics	Explain in the NIR any discrepancies regarding the apparent consumption data reported in its inventory to the UNFCCC, the data from the energy balance of the Statistical Office of the Slovak Republic and the data reported to IEA	23
	International bunker fuels	Provide information in the NIR regarding the share of fuel consumption reported as civil aviation and international aviation, which are based on expert judgement, and investigate the representativeness of the assumed constant shares of time-trends of fuel consumption share between aviation and the international bunker throughout the entire time series	24
	Feedstocks and non-energy use of fuels	Complete the reporting of information on natural gas used as feedstock in ammonia production for the whole time series and make the necessary effort to to fill gaps	25
	Stationary combustion: liquid fuels – CO_2, CH_4 and N_2O	Ensure that CO_2, CH_4 and N_2O emissions from petroleum refining are reported in a consistent manner with CO_2 emissions	27
	Road transportation: liquid fuels – N_2O	Revisit and explain the trends of N_2O implied emission factors for gasoline and diesel	28
Industrial processes and solvent and other product use	Completeness and transparency	Clarify whether emissions for the following categories occur: CO_2 emissions from asphalt roofing; CO_2 emissions from road paving with asphalt; and CH_4 and N_2O emissions from glass production, and use the appropriate notation key for reporting emissions for these categories	31
	Calcium carbide production and use – CO_2	Include an explanation in the NIR clarifying that calcium carbide is not imported to the country and that emissions from its use do not occur	36
Agriculture	Enteric fermentation – CH_4	Include explanations in the NIR on how the country-specific average gross energy intake is calculated for non-dairy cattle and provide justifications for the trends based on regional discrepancies	39
	Agricultural soils – N_2O	Improve the description in the NIR of the country-specific methodology to estimate emissions from nitrogen-fixing crops and crop residues	40
		Enhance the reference for the expert estimation of country-specific parameters in relation to the definition of agro-climatic zones and in relation to the allocation of AD in each climatic zone	41

Sector	*Category*	*Recommendation*	*Paragraph cross-reference*
LULUCF	Completeness and accuracy	Continue the on-going technical research (the C-FORLAND project) in order to provide reliable data for estimating carbon stock changes in dead organic matter and soil carbon	44
	Recalculations	Report recalculations in a transparent manner in the NIR and provide all updated information on AD, EFs and methodologies, explaining where these depart from the current methodologies	46
	Completeness	Provided information in the NIR supporting the assumption that lime application and nitrogen fertilization in forests in the country is not practised	47
	Uncertainty analysis	Conduct the tier 1 uncertainty analyses at the land-use subcategory level	48
	Transparency	Improve the transparency of its reporting by providing a clear description of the process to estimate the mean value of soil organic carbon stocks in each land-use category and refer to the original data source	49
		Include in the NIR a matrix on average annual changes of soil organic carbon over the length of transition period for different types of land-use conversion using plus/minus signs, as appropriate	50
	Forest land – CO_2	Improve the transparency by providing a clear description of the process used to determine current annual increments (annual growth rate for individual tree species)	51
		Provide explanations in the NIR on reporting of the annual harvest volumes in Slovakia and that the AD used includes all harvest in the country	52
		Provide the correct values for the parameter biomass expansion factors for the conversion of merchantable volume to total above-ground volume (BEF_2) in the NIR	53
		Improve the transparency of its reporting by providing a clear description of the process of aggregation of the biomass expansion factors, and justify in the NIR the use of methodologies from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) in terms of the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) and country-specific circumstances	54
	Forest land remaining forest land – CO_2	To estimate carbon stock changes in dead organic matter, use equation 3.2.7 of the IPCC good practice guidance for LULUCF, under which the fraction of biomass left to decay in forest should be set to 0, or use a tier 2 methodology	55
	Cropland remaining	Include in the NIR the provided explanations on the trend	57

Sector	*Category*	*Recommendation*	*Paragraph cross-reference*
	cropland – CO_2	and inter-annual variations on carbon stock changes in soils.	
		Provide a clear description of the process of calculating decreases in carbon stocks in the living biomass pool (perennial woody crops)	58
	Land converted to grassland – CO_2	Provide the explanation for the trend and inter-annual variations of carbon stock changes in living biomass for land converted to grassland in the NIR	59
		Use default carbon stock values, in accordance with the IPCC good practice guidance for LULUCF (table 3.3.2), for the annual crops but also for the perennial woody crops when estimating carbon stock changes in land conversion from cropland to grassland	60
	Land converted from grassland – CO_2	Use the default values for cold temperate climate – wet to estimate total (above-ground and below-ground) non-woody biomass for grassland, prior to conversion	61
	Biomass burning – CO_2, CH_4 and N_2O	Include CO_2 emissions from controlled burning in the total biomass loss associated with harvesting in CRF table 5.A.1. and not included these emissions in CRF table 5(V), in order to avoid double counting	62
		Improve the transparency of reporting by providing separately a clear description of the process used to determine the annual loss of biomass (e.g. the actual area and above-ground biomass subject to biomass burning) and the fraction of biomass burned on site (e.g. related references) from controlled burning and wild fires	63, 64
Waste	Solid waste disposal on land – CH_4	Correct the submission by placing the values of degradable organic carbon and the fraction of degradable organic carbon in municipal solid waste in the correct places in CRF table 6.A	68
		Report emissions for the period 1990–1996 using an interpolation method in accordance with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*	69
		Include more transparent information on industrial and agricultural waste composition as a reiteration of the previous recommendation to the Party regarding the value of the municipal waste generation.	69
	Wastewater handling – CH_4	Include estimates of CH_4 emissions from the stabilization process of sludge or provide documentation that emissions do not occur	71
	Other – CH_4 and N_2O	Make efforts to improve the consistency of the emissions trend in accordance with the IPCC good practice guidance	73

Sector	*Category*	*Recommendation*	*Paragraph cross-reference*
KP-LULUCF	Afforestation and reforestation – CO_2, CH_4 and N_2O	Improve the transparency and consistency of the values of above-ground biomass increment reported in the NIR	75
		Provide an estimate of biomass losses from cleaning on afforestation/reforestation lands	76
		Change the notation key from "NA" to "NO" or provide an estimate for several categories that are reported as "NO" in table NIR-1	77
		Include explanations in the NIR that the dead wood pool is not a net source because the land-use categories of cropland, grassland, settlements and other lands do not contain significant amounts of dead wood	78
		Provide clear evidence that controlled burning and wildfires do not occur on areas under Article 3, paragraph 3, of the Kyoto Protocol, or provide an estimate of emissions from wildfires on these areas	79
	Deforestation – CO_2 and N_2O	Improve the transparency of its reporting by providing a clear description of the process of aggregation of the biomass conversion and expansion factors	81
		Provide the relevant reference for determining root-to-shoot ratios (R) values	82
		Justify, in the NIR of its next annual submission, its use of methodologies from the 2006 IPCC Guidelines in terms of the IPCC good practice guidance for LULUCF and country-specific circumstances	82
		Provide an estimate of N_2O emissions from disturbance associated with land-use conversion to cropland	83
National registry		Include all other additional information in response to the standard independent assessment report findings in its NIR in accordance with decision 15/CMP.1, annex, chapter I.G	90
Article 3, paragraph 14		Report on changes made as a result of changes to the previous reporting on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol	91

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, IEA = International Energy Agency, IPCC = Intergovernmental Panel on Climate Change, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NEIS = National Emission Information System, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

IV. Questions of implementation

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

Annex I

Background data on recalculations and information to be included in the compilation and accounting database

Table 9
Recalculations in the 2013 annual submission for the base year and the most recent year

Greenhouse gas source and sink categories	*1990*	*2010*	*1990*	*2010*	*Reason for the recalculation*
	Value of recalculation (Gg CO_2 eq)		*Per cent change*		
1. Energy	–29.70	–218.09	–0.1	–0.7	Changed AD, EFs
A. Fuel combustion (sectoral approach)	–29.70	–218.09	–0.1	–0.7	
1. Energy industries		–113.41		–1.2	
2. Manufacturing industries and construction		0.00		0.0	
3. Transport		–0.63		0.0	
4. Other sectors	–29.70	–103.44	–0.3	–2.3	
5. Other		–0.62			
B. Fugitive emissions from fuels					
1. Solid fuels					
2. Oil and natural gas					
2. Industrial processes		0.06		0.0	Changed AD, methods
A. Mineral products					
B. Chemical industry		0.06		0.0	
C. Metal production					
D. Other production					
E. Production of halocarbons and SF_6					
F. Consumption of halocarbons and SF_6		–0.34		–0.1	
G. Other					
3. Solvent and other product use					
4. Agriculture					
A. Enteric fermentation					
B. Manure management					
C. Rice cultivation					
D. Agricultural soils					
E. Prescribed burning of savannas					
F. Field burning of agricultural residues					
G. Other					
5. Land use, land-use change and forestry	276.28	–826.72	–2.7	13.6	Changed AD

Greenhouse gas source and sink categories	*1990*	*2010*	*1990*	*2010*	*Reason for the recalculation*
	Value of recalculation (Gg CO_2 eq)		*Per cent change*		
A. Forest land	207.37	–750.57	–2.0	14.1	
B. Cropland	119.52	–40.28	–66.2	5.6	
C. Grassland	–22.36	–18.41	6.8	5.6	
D. Wetlands					
E. Settlements	–1.77	–7.79	–1.5	–6.5	
F. Other land	–26.47	–9.67	–6.6	–7.0	
G. Other					
6. Waste		0.63		0.0	Changed AD
A. Solid waste disposal on land					
B. Wastewater handling		0.63		0.1	
C. Waste incineration					
D. Other					
7. Other					
Total CO_2 equivalent without LULUCF	–29.70	–217.39	0.0	–0.5	
Total CO_2 equivalent with LULUCF	246.58	–1 044.11	0.4	–2.6	

Abbreviations: AD = activity data, EF = emission factor, LULUCF = land use, land-use change and forestry.

Table 10
Information to be included in the compilation and accounting database in t CO_2 eq for 2011, including the commitment period reserve

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	226 484 821			226 484 821
Annex A emissions for 2011				
CO_2	37 671 871			37 671 871
CH_4	4 138 493			4 138 493
N_2O	3 009 356			3 009 356
HFCs	439 499			439 499
PFCs	17 001			17 001
SF_6	20 744			20 744
Total Annex A sources	**45 296 964**			**45 296 964**
Activities under Article 3, paragraph 3, for 2011				
3.3 Afforestation and reforestation on non-harvested land for 2011	–527 854			–527 854
3.3 Afforestation and reforestation on harvested land for 2011	NA			NA
3.3 Deforestation for 2011	38 528			38 528
Activities under Article 3, paragraph 4, for 2011[c]				
3.4 Forest management for 2011				
3.4 Cropland management for 2011				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2011				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2011				
3.4 Revegetation in the base year				

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 11
Information to be included in the compilation and accounting database in t CO_2 eq for 2010

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2010				
CO_2	37 911 159			37 911 159
CH_4	4 107 721			4 107 721
N_2O	3 416 266			3 416 266
HFCs	420 158			420 158
PFCs	21 154			21 154
SF_6	19 902			19 902
Total Annex A sources	**45 896 360**			**45 896 360**
Activities under Article 3, paragraph 3, for 2010				
3.3 Afforestation and reforestation on non-harvested land for 2010	–512 425			–512 425
3.3 Afforestation and reforestation on harvested land for 2010	NA			NA
3.3 Deforestation for 2010	141 191			141 191
Activities under Article 3, paragraph 4, for 2010[c]				
3.4 Forest management for 2010				
3.4 Cropland management for 2010				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2010				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2010				
3.4 Revegetation in the base year				

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 12
Information to be included in the compilation and accounting database in t CO_2 eq for 2009

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2009				
CO_2	35 802 008			35 802 008
CH_4	4 195 408			4 195 408
N_2O	3 541 497			3 541 497
HFCs	380 084			380 084
PFCs	17 761			17 761
SF_6	19 389			19 389
Total Annex A sources	**43 956 146**			**43 956 146**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009	–469 732			–469 732
3.3 Afforestation and reforestation on harvested land for 2009	NA			NA
3.3 Deforestation for 2009	212 340			212 340
Activities under Article 3, paragraph 4, for 2009[c]				
3.4 Forest management for 2009				
3.4 Cropland management for 2009				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2009				
3.4 Revegetation in the base year				

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 13
Information to be included in the compilation and accounting database in t CO_2 eq for 2008

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2008				
CO_2	40 492 913			40 492 913
CH_4	4 378 940			4 378 940
N_2O	3 852 085			3 852 085
HFCs	335 166			335 166
PFCs	36 162			36 162
SF_6	18 511			18 511
Total Annex A sources	**49 113 776**			**49 113 776**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008	–453 553			–453 553
3.3 Afforestation and reforestation on harvested land for 2008	NA			NA
3.3 Deforestation for 2008	134 798			134 798
Activities under Article 3, paragraph 4, for 2008[c]				
3.4 Forest management for 2008				
3.4 Cropland management for 2008				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2008				
3.4 Revegetation in the base year				

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Annex II

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/SBSTA/2006/9. Available at <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

"Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". FCCC/CP/2002/8. Available at <http://unfccc.int/resource/docs/cop8/08.pdf>.

"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

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

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

Status report for Slovakia 2013. Available at <http://unfccc.int/resource/docs/2013/asr/svk.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2013. Available at <http://unfccc.int/resource/webdocs/sai/2013.pdf>.

FCCC/ARR/2012/SVK. Report of the individual review of the annual submission of Slovakia submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/svk.pdf>.

Standard independent assessment report, parts 1 and 2. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Janka Szemesova (Slovak Hydrometeorological Institute), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Slovakia:

Siska, Spanik. 2008. *Agroclimatic regionalization of Slovak territory in conditions of climate change*. Bratislava. Meteorologický časopis, *11*, 2008, pages 63–66

Siska, Horak. 2007. *Modeling N_2O Emissions from Agricultural Used Soil of Experimental Area: Sensitivity Analysis* Bioclimatology and Natural Hazards proceedings 2007.

[1] Reproduced as received from the Party.

Annex III

Acronyms and abbreviations

AD	activity data
A/R	afforestation and reforestation
BCEF	biomass conversion and expansion factors
BEF_1	conversion of merchantable increment to total above-ground increment
BEF_2	conversion of merchantable volume to total above-ground volume
C	carbon
CAI	current annual increment
CH_4	methane
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
DOC	degradable organic carbon
DOM	dead organic matter
EF	emission factor
ERT	expert review team
EU	European Union
EU ETS	European Union's Emissions Trading Scheme System
F-gas	fluorinated gas
GE	gross energy intake [OK?]
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
ha	hectare
HFCs	hydrofluorocarbons
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1,000 grams)
KP-LULUCF	land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
Mg	megagram (1 Mg = 1 tonne)
MSW	municipal solid waste
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
R	root-to-shoot ratio
SOC	soil organic carbon
SEF	standard electronic format
SF_6	sulphur hexafluoride

SIAR	standard independent assessment report
SWDS	solid waste disposal sites
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change