COMPLIANCE COMMITTEE

CC/ERT/ARR/2013/21
5 July 2013

Report of the individual review of the annual submission of the Czech Republic submitted in 2012

Note by the secretariat

The report of the individual review of the annual submission of the Czech Republic submitted in 2012 was published on 28 June 2013. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2011/CZE, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the individual review of the annual submission of the Czech Republic submitted in 2012[*]

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Contents

I. Introduction and summary

1.   This report covers the centralized review of the 2012 annual submission of the Czech Republic, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 3 to 8 September 2012 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Mario Contaldi (Italy); energy – Mr. Jongikhaya Witi (South Africa), Mr. Kaleem Anwar Mir (Pakistan) and Mr. Graham Anderson (Australia); industrial processes – Ms. Siriluk Chiarakorn (Thailand), Mr. Samir Tantawi (Egypt) and Mr. Eilev Gjerald (Norway); agriculture – Ms. Olga Gavrilova (Estonia) and Mr. Amnat Chidthaisong (Thailand); land use, land-use change and forestry (LULUCF) – Mr. Lucio Santos (Colombia) and Mr. Nalin Srivastava (India); and waste – Ms. Hlobsile Sikhosana (Swaziland) and Ms. Masako White (Japan). Mr. Witi and Mr. Contaldi were the lead reviewers. The review was coordinated by Mr. Stylianos Pesmajoglou (UNFCCC secretariat).

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

3.   In 2010, the main greenhouse gas (GHG) in the Czech Republic was carbon dioxide (CO_2), accounting for 86.0 per cent of total GHG emissions[1] expressed in CO_2 eq, followed by methane (CH_4) (7.4 per cent) and nitrous oxide (N_2O) (5.5 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 82.7 per cent of total GHG emissions, followed by the industrial processes sector (8.6 per cent), the agriculture sector (5.7 per cent), the waste sector (2.6 per cent) and the solvent and other product use sector (0.4 per cent). Total GHG emissions amounted to 139,523.38 Gg CO_2 eq and decreased by 28.9 per cent between the base year[2] and 2010.

4.   Tables 1 and 2 show GHG emissions from 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, 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.   Tables 3–5 provide information on the most important emissions and removals and accounting parameters that will be included in the compilation and accounting database.

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[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 CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources 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 2010

										Change (%)
						$Gg\ CO_2\ eq$				
	Greenhouse gas	Base year^a	1990	1995	2000	2005	2008	2009	2010	Base year–2010
Annex A sources	CO_2	165 096.97	165 096.97	128 330.30	126 052.17	127 211.94	123 921.18	116 012.51	120 038.73	–27.3
	CH_4	17 815.07	17 815.07	13 311.33	11 087.16	10 405.62	10 394.95	10 089.20	10 290.26	–42.2
	N_2O	13 333.53	13 333.53	9 254.38	8 677.87	8 427.44	8 419.78	7 880.56	7 645.38	–42.7
	HFCs	0.73	NA, NE, NO	0.73	262.50	594.21	1 262.45	1 041.67	1 503.36	204 578.5
	PFCs	0.12	NA, NE, NO	0.12	8.81	10.08	27.48	27.14	29.43	2 922.5
	SF_6	75.20	77.68	75.20	141.92	85.88	47.04	49.61	16.22	–78.4
KP-LULUCF — Article 3.3^b	CO_2						–112.21	–124.92	–115.82	
	CH_4						NO	NO	NO	
	N_2O						0.42	0.43	0.43	
KP-LULUCF — Article 3.4^c	CO_2	NA					–4 562.21	–6 574.92	–5 237.44	NA
	CH_4	NA					143.63	121.44	128.21	NA
	N_2O	NA					14.58	12.35	13.01	NA

Abbreviations: 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, NE = not estimated, NO = not occurring.

^{a} "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

^{b} Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

^{c} Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation, the base year and the inventory years of the commitment period must be reported.

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2010

					Gg CO$_2$ eq					*Change (%)*
	Sector	*Base year[a]*	*1990*	*1995*	*2000*	*2005*	*2008*	*2009*	*2010*	*Base year–2010*
Annex A	Energy	157 049.13	157 049.13	123 947.97	119 947.79	121 559.21	117 397.49	111 756.89	115 383.20	−26.5
	Industrial processes	19 601.21	19 602.83	13 188.23	13 561.11	12 980.15	14 085.39	11 174.72	12 061.14	−38.5
	Solvent and other product use	764.83	764.83	596.31	568.56	513.77	515.27	506.15	502.68	−34.3
	Agriculture	16 233.28	16 233.28	10 331.98	9 094.86	8 385.03	8 583.06	8 134.29	7 964.57	−50.9
	Waste	2 673.17	2 673.17	2 907.58	3 058.11	3 297.01	3 491.67	3 528.62	3 611.79	35.1
	LULUCF	NA	−3 617.94	−7 210.11	−7 524.24	−6 685.51	−4 772.86	−6 863.11	−5 518.50	NA
	Total (with LULUCF)	**NA**	**192 705.31**	**143 761.96**	**138 706.18**	**140 049.66**	**139 300.03**	**128 237.56**	**134 004.89**	**NA**
	Total (without LULUCF)	**196 321.63**	**196 323.25**	**150 972.07**	**146 230.43**	**146 735.17**	**144 072.89**	**135 100.67**	**139 523.38**	**−28.9**
	Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
KP-LULUCF · Article 3.3[c]	Afforestation and reforestation						−271.99	−294.68	−322.26	
	Deforestation						160.20	170.19	206.87	
	Total (3.3)						**−111.79**	**−124.48**	**−115.39**	
KP-LULUCF · Article 3.4[d]	Forest management						−4 403.99	−6 441.15	−5 096.22	
	Cropland management	NA					NA	NA	NA	NA
	Grazing land management	NA					NA	NA	NA	NA
	Revegetation	NA					NA	NA	NA	NA
	Total (3.4)	**NA**					**−4 403.99**	**−6 441.15**	**−5 096.22**	**NA**

Abbreviations: 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, NA = not applicable.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF$_6$. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

[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. Only the inventory years of the commitment period must be reported.

[d] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation, the base year and the inventory years of the commitment period must be reported.

Table 3
Information to be included in the compilation and accounting database in t CO$_2$ eq for the year 2010, including the commitment period reserve

	As reported	Revised estimates	Adjustment[a]	Final[b]
Commitment period reserve	668 196 835	697 616 911		697 616 911
Annex A emissions for current inventory year				
CO$_2$	119 866 379	120 038 726		120 038 726
CH$_4$	10 284 451	10 290 261		10 290 261
N$_2$O	7 458 021	7 645 382		7 645 382
HFCs	1 503 363			1 503 363
PFCs	29 428			29 428
SF$_6$	16 221			16 221
Total Annex A sources	**139 157 863**	**139 523 382**		**139 523 382**
Activities under Article 3, paragraph 3, for current inventory year				
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	−322 263			−322 263
3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported	NO			NO
3.3 Deforestation for current year of commitment period as reported	206 873			206 873
Activities under Article 3, paragraph 4, for current inventory year[c]				
3.4 Forest management for current year of commitment period	−5 096 223			−5 096 223
3.4 Cropland management for current year of commitment period				
3.4 Cropland management for base year				
3.4 Grazing land management for current year of commitment period				
3.4 Grazing land management for base year				
3.4 Revegetation for current year of commitment period				
3.4 Revegetation in base year				

Abbreviation: NO = not occurring.

[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 4
Information to be included in the compilation and accounting database in t CO_2 eq for the year 2009

	As reported	Revised estimates	Adjustment[a]	Final[b]
Annex A emissions for 2009				
CO_2	115 847 608	116 012 506		116 012 506
CH_4	10 084 136	10 089 196		10 089 196
N_2O	7 672 144	7 880 558		7 880 558
HFCs	1 041 666			1 041 666
PFCs	27 136			27 136
SF_6	49 609			49 609
Total Annex A sources	**134 722 299**	**135 100 672**		**135 100 672**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009 as reported	–294 675			–294 675
3.3 Afforestation and reforestation on harvested land for 2009 as reported	NO			NO
3.3 Deforestation for 2009 as reported	170 193			170 193
Activities under Article 3, paragraph 4, for 2009[c]				
3.4 Forest management for 2009	–6 441 150			–6 441 150
3.4 Cropland management for 2009				
3.4 Cropland management for base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for base year				
3.4 Revegetation for 2009				
3.4 Revegetation in base year				

Abbreviation: NO = not occurring.

[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 5
Information to be included in the compilation and accounting database in t CO_2 eq for the year 2008

	As reported	Revised estimates	Adjustment[a]	Final[b]
Annex A emissions for 2008				
CO_2	123 725 222	123 921 179		123 921 179
CH_4	10 389 983	10 394 955		10 394 955
N_2O	8 210 440	8 419 777		8 419 777
HFCs	1 262 451			1 262 451
PFCs	27 481			27 481
SF_6	47 045			47 045
Total Annex A sources	**143 662 621**	**144 072 888**		**144 072 888**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008 as reported	–271 989			–271 989
3.3 Afforestation and reforestation on harvested land for 2008 as reported	NO			NO
3.3 Deforestation for 2008 as reported	160 203			160 203
Activities under Article 3, paragraph 4, for 2008[c]				
3.4 Forest management for 2008	–4 403 993			–4 403 993
3.4 Cropland management for 2008				
3.4 Cropland management for base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for base year				
3.4 Revegetation for 2008				
3.4 Revegetation in base year				

Abbreviation: NO = not occurring.
[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.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

6. The 2012 annual inventory submission was submitted on 15 April 2012; it contains a complete set of common reporting format (CRF) tables for the period 1990–2010. The national inventory report (NIR) was submitted on 18 April 2012. The Czech Republic also submitted 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 2012. The annual submission was not submitted in accordance with decision 15/CMP.1. The ERT strongly encourages the Czech Republic to submit its next inventory (CRF tables and NIR) by 15 April 2013 as required by decision 15/CMP.1.

7. The Czech Republic officially submitted revised emission estimates on 19 October 2012 in response to questions raised by the expert review team (ERT) during the review. The figures contained in this report are those submitted by the Party on 19 October 2012.

8. The ERT also used the previous years' submissions during the review. In addition, the ERT used the standard independent assessment report (SIAR), parts I and II, to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.[3]

9. During the review, the Czech Republic provided the ERT with additional information. The document concerned is part of the annual submission. The full list of materials used during the review is provided in annex I to this report.

Completeness of inventory

10. The inventory covers most source and sink categories for the period 1990–2010 and is complete in terms of years and geographical coverage. The ERT encourages the Czech Republic to continue its efforts to include in its inventory emission estimates for SF_6 emissions from disposal and decommissioning and other subcategories under forest land remaining forest land and land converted to forest land for which there are no methodologies or emission factors (EFs) for estimating emissions 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) or in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines).

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[3] The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5(a), and 6(c) and (k)), under the auspices of the international transaction log (ITL) administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry.

2. **A description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management**

Overview

11.   The ERT concluded that the national system continued to perform its required functions. However, the ERT noted that a lack of resources continues to affect the accuracy and continuous improvement of the quality of the inventory by restricting the collection of additional data and the elaboration of higher-tier estimation methods for key categories in the following sectors: industrial processes, agriculture, LULUCF and for KP-LULUCF activities. Moreover, the Party still does not have a centralized archiving system in place.

12.   The Czech Republic described the changes in the national system since the previous annual submission and these changes are discussed in chapter II.G.3 of this report.

13.   The ERT strongly recommends that the Party further strengthen the capacity of its national system so that the accuracy of the inventory can be improved by moving to higher-tier estimation methods and by fully implementing and maintaining the archiving system for its annual submissions in its next annual submission.

Inventory planning

14.   The NIR described the national system for the preparation of the inventory. The Ministry of the Environment (MoE) has overall responsibility for the national inventory and secures contracts with other governmental bodies involved in the preparation of the national inventory, such as the Czech Statistical Office (CZSO), the Ministry of Industry and Trade and the Ministry of Agriculture.

15.   The Czech Hydrometeorological Institute (CHMI), under the supervision of MoE, is designated as the coordinating and managing organization responsible for the compilation of the national inventory and for reporting. CHMI aims to ensure quality management through the implementation of the quality assurance/quality control (QA/QC) plan and oversees the archiving system. The national inventory is prepared by CHMI and approved by MoE prior to its submission to the UNFCCC secretariat.

16.   The ERT noted a number of planned inventory improvements described in the sector-specific sections of the NIR and details of possible improvements in response to recommendations in previous review reports. The ERT welcomes the submission of an updated QA/QC plan in the 2012 annual submission, which includes the gradual implementation of higher-tier estimation methods, as recommended in the previous review report.

17.   In response to a question raised by the ERT during the review, following the recommendation in the previous review report, the Party provided a draft list of priority improvements; however, the Party noted that there are budget restrictions and staffing issues that make implementation of these improvements a challenge. The ERT strongly recommends that the Party resolve its issues of budget restrictions and staff shortages, that it prioritize the listed improvements on the basis of its key category and uncertainty analyses and that it improve the transparency of its reporting on the improvements made in its next annual submission.

Inventory preparation

Key categories

18.   The Czech Republic has reported a tier 1 key category analysis, both level and trend assessment, as part of its 2012 annual submission for the base year and for 2010. The key

category analysis performed by the Czech Republic and that performed by the secretariat[4] produced similar results. The Party has included the LULUCF sector in its key category analysis, which was performed in accordance with 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).

19.   In response to a question raised by the ERT during the review, the Party specified that a tier 2 key category analysis was not performed owing to resource constraints. The ERT encourages the Czech Republic to perform a tier 2 key category analysis for its next annual submission.

20.   In its response to questions raised by the ERT during the review, the Czech Republic explained that it uses the results of the key category analysis to prioritize the development and improvement of the inventory.

21.   The Czech Republic has identified CO_2 emissions from forest management under Article 3, paragraph 3, of the Kyoto Protocol as a key category for both level and trend assessment for 2010. The results of the key category analysis are presented both in KP-LULUCF table NIR-3 and in the NIR.

Uncertainties

22.   The Czech Republic has reported a tier 1 uncertainty analysis in the NIR. According to the NIR, the inventory level assessment of uncertainty, including the LULUCF sector, is estimated at ±3.8 per cent. The trend uncertainty is estimated at ±2.4 per cent. The inventory level assessment of uncertainty, excluding the LULUCF sector, is estimated at ±3.5 per cent, with the corresponding trend uncertainty estimated at ±2.4 per cent.

23.   The uncertainty analysis is based on the IPCC default values and expert judgement and generally follows the IPCC good practice guidance. However, the ERT noted that little or no documentation has been provided on the expert judgement used to derive the uncertainty values for the activity data (AD) and EFs used to estimate emissions from the industrial processes, agriculture, LULUCF and waste sectors. Further, the Party does not have an established procedure for eliciting expert judgement as defined in the IPCC good practice guidance. The ERT therefore reiterates the recommendation in the previous review report that the Czech Republic establish and follow the procedure defined in the IPCC good practice guidance for eliciting expert judgement and provide the documentation on the expert judgement used to derive the uncertainty values in its next annual submission.

Recalculations and time-series consistency

24.   Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party of the base year to 2009 have been undertaken to take into account improvements in AD (the energy sector: energy industries, manufacturing industries and construction, transport – other, other (energy); the agriculture sector: enteric fermentation, manure management and agricultural soils; and the waste sector: solid waste disposal on land and waste incineration) and EFs (energy sector: fugitive emissions from solid fuels; the industrial processes sector: metal production – iron and steel). Other recalculations were performed to follow the recommendations made in previous review reports. Owing to the numerous recalculations

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[4] The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

made, the ERT found that the most appropriate figure to evaluate the magnitude of the impact of the recalculations is the difference between the estimated total GHG emissions reported for the base year and 2008 in the 2010 and 2012 annual submissions, excluding LULUCF. The magnitude of the impact includes the following: an increase in estimated total GHG emissions for the base year (0.3 per cent) and for 2008 (1.6 per cent). The rationale for these recalculations is provided in the NIR.

Verification and quality assurance/quality control approaches

25.   The Czech Republic has provided information on its QA/QC procedures, in line with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines). An overall QA/QC plan managed by CHMI is in place and is in accordance with decision 19/CMP.1 and the IPCC good practice guidance. The QA/QC plan has been updated for the 2012 annual submission, following the recommendations in the previous review report. The ERT welcomes the improvement of sector-specific QA/QC for the agriculture sector (see para. 74 below); however, it noted the continuing lack of sector-specific QA/QC checks for the LULUCF sector (see para. 88 below)

26.   The ERT noted that the Czech Republic delegates certain QA/QC responsibilities to the organizations responsible for preparing the sector-specific parts of the inventory via formal contracts. The ERT also noted that, in order to verify the emission estimates for some categories in the industrial processes sector, the Party used relevant data from the European Union emissions trading scheme (EU ETS). The ERT further noted several errors in the CRF tables for the reference and sectoral approaches (see para. 41 below) and some inconsistencies between the CRF tables and the NIR in relation to the waste sector (wastewater handling; see para. 105 below). Specific recommendations are presented in the relevant sector chapters of this report.

Transparency

27.   The information contained in the NIR is generally transparent but is, in some cases, insufficient for the ERT to understand the methods, data sources and assumptions used to estimate emissions (e.g. ammonia production (see para. 66 below), nitrogen (N) excretion rates (see para. 74 below) and disposal of sewage sludge used on agricultural soils (see paras. 80 and 103 below)). Recalculations have been documented, including the rationale for the changes. The ERT recommends that the Czech Republic provide further details in the NIR on the methods and EFs used for the calculation of emission estimates, as well as a description of the data sources and assumptions used, for the above-mentioned emission categories, in its next annual submission.

Inventory management

28.   The Czech Republic does not yet have a centralized archiving system and the problem has been addressed through a recommendation in previous review reports. In the NIR it is stated that plans are being developed for a centralized archive at CHMI. In response to a question raised by the ERT during the review, the ERT was provided with the requested additional archived information. In its NIR, the Party described the changes that have occurred in relation to archiving since its previous annual submission. However, owing to budget restrictions and staff shortages, the Czech Republic started to implement a new archiving system in 2012, with full implementation planned for after April 2012. The ERT recommends that the Party complete the implementation of a proper archiving system before its next annual submission.

3. Follow-up to previous reviews

29.   In order to comply with the relevant recommendations in previous review reports (mainly the 2010 and 2011 annual review reports (ARRs)), many changes were performed by the Party for its 2012 annual submission. The ERT welcomes the improvements made, which are reported in detail in the NIR. In particular, chapter 10 of the 2012 NIR contains an extensive list of more than 50 categories subject to improvements in the estimation methodologies.

30.   In the Party's 2012 annual submission, the NIR, for the first time, contains an improvement plan for the next annual submission. The ERT welcomes the plan and noted that it is in accordance with the recommendations made in previous review reports and concentrates particularly on the introduction of more sophisticated procedures and the use of higher-tier estimation methods where necessary.

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

31.   During the review, the ERT identified several issues for improvement. These are listed in table 6 below.

32.   Recommended improvements relating to specific categories are presented in the relevant sector chapters of this report and in table 6 below.

B. Energy

1. Sector overview

33.   The energy sector is the main sector in the GHG inventory of the Czech Republic. In 2010, emissions from the energy sector amounted to 115,383.20 CO_2 eq, or 82.7 per cent of total GHG emissions. Since 1990, emissions have decreased by 26.5 per cent. The key drivers for the fall in emissions are the declining production in manufacturing industries and construction, which is linked with a decrease in fuel consumption, as well as the shift towards the use of less carbon-intensive fuels in the other sectors, with an emphasis on the commercial and residential subcategories. Within the sector, 48.9 per cent of the emissions were from energy industries, followed by 20.7 per cent from manufacturing industries and construction, 15.1 per cent from transport and 10.7 per cent from other sectors. Fugitive emissions accounted for 3.7 per cent of the sectoral emissions and other (energy) accounted for 1.0 per cent.

34.   The Czech Republic has made recalculations for the energy sector between the 2011 and 2012 annual submissions in response to the 2011 ARR. The impact of these recalculations on the energy sector is an increase in the estimate of emissions for 2009 of 1.6 per cent. The main recalculations took place in the following categories:

    (a) CO_2, CH_4 and N_2O emissions from energy industries (–5,130.70 Gg CO_2 eq or –8.7 per cent);

    (b) CO_2, CH_4 and N_2O emissions from manufacturing industries and construction (7,520.28 Gg CO_2 eq or 47.8 per cent);

    (c) CO_2, CH_4 and N_2O emissions from other sectors (139.48 Gg CO_2 eq or 1.3 per cent).

35.   The reporting on the energy sector is complete in terms of gases and years, and generally complete in terms of categories. The ERT noted that a few subcategories were reported as not estimated ("NE"), such as CO_2 emissions from mining and post-mining activities under the category surface mines. The ERT also noted that IPCC estimation methods and/or EFs are not available for those subcategories. The ERT encourages the

Czech Republic to provide emission estimates for the categories currently reported as "NE" in its next annual submission.

36. In response to recommendations in the previous review report, the Czech Republic improved QA/QC in the energy sector by removing the inconsistency in the identification of key categories between the NIR and the CRF tables that appeared in the 2011 annual submission. The ERT commends the Czech Republic for ensuring consistency in its reporting of the number of key categories between CRF table 7 and the NIR.

37. The Czech Republic has provided in the NIR information on the general emission trends in the energy sector. In response to recommendations in the previous review report, the NIR provides detailed explanations of the drivers of the emission trends, particularly for fuels used in stationary combustion, including information on the challenge of achieving consistency in the AD time series.

38. The Czech Republic has reported on its QA/QC procedures for the energy sector and demonstrated how it implements such procedures. In response to recommendations in the previous review report, the Party has now formalized QA/QC procedures as part of the process followed by KONEKO Marketing Ltd for the preparation of estimates of emissions from stationary combustion. The ERT noted that the procedures of KONEKO Marketing Ltd for ensuring the QA/QC of the work done by the Transport Research Centre (CDV) in relation to emissions from transport have improved. The Czech Republic works with CZSO to ensure that CDV works with the most recent AD on fuel consumption for estimating emissions for the transport category.

39. The Czech Republic used a tier 1 method to assess the uncertainty of its emission estimates for the energy sector. The ERT encourages that the Czech Republic also implement a tier 2 methodology for its uncertainty analysis.

2. Reference and sectoral approaches

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

40. Following a recommendation in the previous review report, in its 2012 annual submission the Czech Republic has reported apparent energy consumption excluding feedstocks and non-energy use of fuels in CRF table 1.A(c). Following the observation of discrepancies in the comparison between the reference and sectoral approaches, the Czech Republic has performed recalculations to its reference approach for the years 1995–2009, which have improved the comparison between the reference and sectoral approaches. In the 2011 annual submission, the difference between the reference approach and the sectoral approach for 2009 for energy consumption was 8.8 per cent and for CO_2 emissions was 6.0 per cent, while in the 2012 annual submission the differences were 3.1 and 2.8 per cent, respectively. The ERT commends the Czech Republic for improving the energy consumption data used in its reference approach.

41. The ERT noted that there is a large difference between the estimated jet kerosene consumption for civil aviation reported in the CRF tables (35.86 TJ) and the corresponding data from the International Energy Agency (IEA) (1,161 TJ). However, the comparison of the estimated jet kerosene consumption for aviation bunkers between that reported in the CRF tables (13,387.14 TJ) and the corresponding IEA data (13,029 TJ) leads to a difference of just 2.7 per cent. The ERT noted that this demonstrates an underestimation of the jet kerosene fuel consumption reported in the CRF tables for civil aviation, given that the total jet kerosene consumption should be more in agreement between the two data sets. In response to the list of potential problems and further questions raised by the ERT during the review week, the Czech Republic conducted an investigation and provided information on how jet kerosene consumption is reported in the CRF tables and in the IEA data. The information provided showed that the estimated total jet kerosene consumption in both data

sets shows agreement, while the shares of international and domestic jet kerosene consumption differ. The Czech Republic explained that this difference can be attributed to the fact that the IEA data include jet kerosene consumption for the subcategories other (mobile), other (manufacturing industries and construction) and other sectors (commercial/institutional) under civil aviation, while in the CRF tables these subcategories are separated and the jet kerosene consumption included under the subcategory civil aviation. The ERT noted that the explanation provided by the Czech Republic provided a transparent analysis of its jet kerosene fuel consumption and that the data presented are in agreement between the CRF tables and the IEA data. The ERT considered the potential problem to be solved and recommends that the Czech Republic include the above-detailed analysis in its next annual submission.

International bunker fuels

42.   The ERT noted that the Czech Republic has accurately reported on aviation bunkers in CRF table 1.C. The Party confirmed that jet kerosene is the only fuel consumed in aviation bunkers. The split in jet kerosene consumption between civil aviation and aviation bunkers is based on data on passenger transport and transport of goods. The ERT considers the split in jet kerosene consumption to be in line with the IPCC good practice guidance.

Feedstocks and non-energy use of fuels

43.   In response to a recommendation in the previous review report, the Czech Republic conducted a review of the carbon storage factor for naphtha. The Czech Republic applied the default carbon storage factor of 80 per cent provided in the Revised 1996 IPCC Guidelines for the period 2006–2010, citing increased recycling rates of plastics. The ERT reiterates the recommendation in the previous review report that the Czech Republic provide documentation to substantiate the expert judgement on the carbon storage factor in its next annual submission.

3.   **Key categories**

Stationary combustion: solid, liquid and gaseous fuels – CO_2

44.   The ERT noted that the Czech Republic has addressed most of the recommendations in the previous review report in relation to this category, such as the proper allocation of emissions between energy industries and manufacturing industries and construction and the improvement of the AD time series for manufacturing industries and construction. Following the recommendation in the previous review report that the Party improve the time-series consistency of the estimates of emissions from manufacturing industries and construction, the Czech Republic has recalculated these emission estimates for the period 1990–2009 by further disaggregating fuel consumption by subcategory. The ERT welcomes these improvements.

45.   The ERT noted that the Czech Republic used country-specific EFs to estimate emissions from solid fuels used in stationary combustion and IPCC default EFs for all other fuels. For the period 1990–1994 the Party used EFs from the 1996 Revised IPCC Guidelines and for the period 1995–2010 the Party used EFs from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines). The ERT also noted that this introduces inconsistencies in the time series, as the CO_2 EFs from the Revised 1996 IPCC Guidelines assume an oxidation factor of 99 per cent, while those from the 2006 IPCC Guidelines are based on the oxidation factor of 100 per cent. In response to the list of potential problems and further questions raised by the ERT during the review week, the Czech Republic submitted revised CO_2 emission estimates associated with liquid and gaseous fuels consumed in all stationary combustion related activities on the basis of the Revised 1996 IPCC Guidelines. The

revised estimates resulted in an increase in the estimate of CO_2 emissions for this category for 2010 from 108,181.21 Gg CO_2 to 109,353.56 Gg CO_2. The ERT agrees with the revised estimates and commends the Party for ensuring the time-series consistency of the CO_2 emission estimates for stationary combustion

46.   The ERT further noted that the Czech Republic has made efforts to harmonize its fuel consumption AD for the category manufacturing industries and construction and has managed to disaggregate fuel consumption by each subcategory under manufacturing industries and construction. The ERT observed that there is an inconsistency in the time series of AD for the subcategory chemicals, more specifically in the period 1990–2002. Specifically, the ERT noted that the fuel consumption AD reported in the NIR do not correlate with the level of production of chemicals prior to 2002. The ERT commends the Czech Republic for its continued efforts to improve its AD time-series consistency and encourages the Party to improve the time-series consistency of the subcategory manufacturing industries and construction – chemicals.

Stationary combustion: biomass – CH_4 and N_2O[5]

47.   In response to a question raised by the ERT during the review as to whether there is charcoal consumption in the Czech Republic, the Party explained that, although charcoal is used for grilling, the CZSO statistical questionnaire does not include consumption of charcoal and, hence, its consumption is considered negligible. Upon investigation, the ERT obtained charcoal production and use statistics for the Czech Republic from the Food and Agriculture Organization Statistical Database (FAOSTAT). The statistics showed that the Czech Republic produces 6,000 t charcoal annually for domestic use. In response to the list of potential problems and further questions raised by the ERT during the review week, the Party submitted revised emission estimates for CH_4 and N_2O emissions from charcoal consumption using the FAOSTAT data and by applying EFs from the Revised 1996 IPCC Guidelines (volume 3, table 1-7 for CH_4 and table 1-8 for N_2O). These calculations resulted in an increase in the estimated biomass-related CH_4 emissions for the subcategory other sectors – residential from 14.55 Gg CO_2 eq to 14.62 Gg CO_2 eq for 2010 and also resulted in minor changes to the estimated N_2O emissions. The ERT agrees with the revised estimates and recommends that the Party transparently document the methods used to estimate CH_4 and N_2O emissions from charcoal use in its next annual submission.

48.   The ERT noted that fugitive CH_4 emissions from charcoal production were not reported in the 2012 annual submission for the entire time series. In response to questions raised by the ERT during the review, the Czech Republic indicated that there are no large charcoal plants in the country, implying that there are a few minor charcoal plants and that the use of charcoal is negligible. Upon further investigation, the ERT noted that FAOSTAT reports unofficial data[6] indicating the possible production of charcoal in the Czech Republic. In response to the list of potential problems and further questions raised by the ERT during the review week, the Party estimated emissions from charcoal production using the FAOSTAT data and by applying the default EFs provided in table 1-14 of the Revised 1996 IPCC Guidelines, resulting in estimates of 0.03 Gg CH_4 emissions for 1990 and 0.20 Gg CH_4 emissions for 2010. The ERT agrees with the CH_4 emission estimates provided by the Czech Republic and recommends that the Party transparently document the methods used to estimate CH_4 emissions from charcoal production in its next annual submission.

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[5] 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.

[6] See <http://faostat.fao.org/site/626/DesktopDefault.aspx?PageID=626#ancor>.

Road transportation: liquid fuels – CO_2

49. During the review, the ERT enquired as to when the Czech Republic plans to develop country-specific CO_2 EFs for liquid fuels used in road transportation. The Party explained that country-specific CO_2 EFs are being developed in a study prioritized for completion in 2013. The ERT welcomes the efforts of the Czech Republic to develop country-specific EFs and recommends that the Party use the results of the study for its 2014 annual submission.

Coal mining and handling – CH_4

50. The ERT noted that the Czech Republic has revised its CH_4 EF for underground coal mining, following the recommendation in the previous review report to review the applicability of the EF to current conditions in the Czech Republic. The EF is based on plant-specific measurements of CH_4. The ERT encourages the Party to have the results of those measurements published in a peer-reviewed journal.

51. Following a recommendation in the previous review report, the Czech Republic has reported, in its 2012 annual submission, on the uncertainty associated with the estimates of fugitive emissions from solid fuels. The ERT noted that the corresponding uncertainty estimates are based on expert judgement, but no explanation of how expert judgement was sought has been provided by the Party. The ERT recommends that the Czech Republic provide, in its next annual submission, a detailed explanation of how expert judgement is sought for the uncertainty analysis in relation to fugitive emissions from solid fuels.[7]

4. Non-key categories

Other transportation: liquid fuels – CO_2, CH_4 and N_2O

52. In response to a question raised by the ERT during the review regarding the allocation of emissions associated with ground activities at airports, the Czech Republic clarified that emissions associated with such activities are reported in the subcategory road transportation instead of other transport. The ERT recommends that the Party revise the use of the notation key for not occurring ("NO") for liquid fuels in the subcategory other transportation and replace it with the notation key for included elsewhere.

C. Industrial processes and solvent and other product use

1. Sector overview

53. In 2010, emissions from the industrial processes sector amounted to 12,061.14 Gg CO_2 eq, or 8.6 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 502.68 Gg CO_2 eq, or 0.4 per cent of total GHG emissions. Since the base year, emissions have decreased by 38.5 per cent in the industrial processes sector and decreased by 34.3 per cent in the solvent and other product use sector. The key driver for the fall in emissions in the industrial processes sector between 1990 and 2010, as stated in the NIR, is the significant decrease in emissions over the period 1990–1994, which was driven mainly by the economic transition and the major production decreases in heavy-industry activities, especially iron and steel production (52.8 per cent reduction in production) in the period 1990–2010. Within the industrial processes sector, 49.5 per cent of the emissions were from metal production, followed by 28.4 per cent from mineral products, 12.8 per cent from consumption of halocarbons and SF_6 and 9.2 per cent from chemical industry. The ERT noted that the Czech Republic reported in its NIR that the share of the industrial processes sector in the country's total GHG emissions including LULUCF is 9.0 per cent and 8.6 per cent excluding LULUCF.

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[7] This also applies to fugitive emissions from oil and natural gas systems.

54.   The Czech Republic has made recalculations for the industrial processes sector between its 2011 and 2012 annual submissions in response to the 2011 ARR and owing to changes in the AD collected for the national inventory. The impact of these recalculations on the industrial processes sector is a minor decrease in estimated emissions by 0.13 Gg CO_2 eq for 2009. The main recalculations took place in the category chemical industry, where there was a decrease in the estimate of CH_4 emissions by 0.13 Gg CO_2 eq because of changes in the AD for dichloroethylene.

55.   The ERT noted that the recalculations were conducted in accordance with the IPCC good practice guidance and resulted in the replacement of the "NE" notation key used to report the subcategory other (chemical industry) with emission estimates, following the recommendation in the previous review report. The ERT recommends that the Czech Republic provide, in the NIR of its next annual submission, an overall figure to demonstrate the impact of the recalculations undertaken for the industrial processes sector for the time series.

56.   In addition, the ERT reiterates the recommendation in the previous review report that the Party provide more transparent information on the methodologies applied for estimating emissions from the industrial processes sector, particularly for the key categories, in its next annual submission. Examples of categories in relation to which transparency could be improved include ammonia production, nitric acid production, iron and steel production and consumption of halocarbons and SF_6 (see paras. 61, 63, 64 and 67 below).

57.   The reporting on the industrial processes and solvent and other product use sectors is complete in terms of gases and years and generally complete in terms of categories. The Czech Republic has reported the following categories as "NE": CO_2 emissions from asphalt roofing and from road paving with asphalt; non-methane volatile organic compound (NMVOC) emissions from asphalt roofing and from road paving with asphalt; and SF_6 emissions from the disposal or decommissioning of electrical equipment. The ERT noted that for the first two categories there are no estimation methodologies available in the Revised 1996 IPCC Guidelines or in the IPCC good practice guidance. In response to a question raised by the ERT during the review regarding the third aforementioned category, the Czech Republic informed the ERT that relevant research has been conducted but that no official statistics on the disposal and decommissioning of electrical equipment in the Czech Republic exist, and so the corresponding emissions are accounted for as a portion of the annual emissions on the basis of expert judgement. The ERT noted that the IPCC good practice guidance provides information on how emissions should be estimated in the absence of official statistics.[8] The ERT recommends that the Party use the information provided in the IPCC good practice guidance and estimate emissions of SF_6 from the disposal or decommissioning of electrical equipment for its next annual submission.

58.   The Czech Republic has reported in the NIR that the uncertainty estimates for the industrial processes sector were calculated on the basis of expert judgement. However, the Party has also reported that it plans to use the uncertainty parameters adopted in European Union (EU) resolution 611/2012 regarding monitoring and reporting GHG emissions under the EU ETS and combining these with default uncertainty values presented in the 2006 IPCC Guidelines. The ERT commends the Czech Republic for such improvement plans and recommends that the Party conduct such planned improvements to the uncertainty estimates for the industrial processes sector, particularly for key categories, and report on the results of its work in its next annual submission.

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[8]   In the absence of official statistics it is recommended that emissions are estimated by multiplying the nameplate capacity of retired equipment by the assumed fraction of SF_6 left in the equipment at the end of its life and, if SF_6 is being recovered, it is good practice to adjust the resulting estimate to reflect recovery, by multiplying it by (1 – the recovery factor). The default recovery factor is zero. Other factors should be country-specific and determined at the site level.

2.   **Key categories**

Cement production – CO_2

59.   For reasons of confidentiality, the Czech Republic has not reported the calcium oxide, dolomite, magnesium carbonate and fissile carbon contents that are used to estimate emissions from cement production. The ERT reiterates the encouragement in the previous review report that the Party continue to collect country-specific data on those parameters and improve the transparency of its reporting by providing the relevant data in its next annual submission.

Nitric acid production – N_2O

60.   Responding to a recommendation in the previous review report, the Czech Republic has provided, in its 2012 annual submission, a separate description of nitric acid production under chemical industry to improve the transparency of how measurements were used to estimate N_2O emissions from nitric acid production, as well as explaining the N_2O emission trends in relation to the N_2O abatement technologies implemented in the nitric acid plants. The ERT is of the view that the description provided by the Party provides a transparent explanation of how N_2O emissions from nitric acid production were estimated. The ERT commends the Party for these improvements.

61.   Following a recommendation made in the previous review report, the Czech Republic has provided, in its 2012 annual submission, more information about the abatement technology used in nitric acid production. The ERT noted that the Party provided in the NIR a table (table 4-8) showing a comparison of the N_2O EFs used by various countries, including Canada, Czech Republic, Norway and United States of America. The EF used by the Czech Republic is derived from a 2009/2010 country study by Markvart and Bernauer, while most other countries use the default IPCC value. The ERT welcomes the information provided by the Party and encourages the Czech Republic to continue improving its reporting by elaborating on the information provided about the abatement technologies used.

Iron and steel production – CO_2

62.   The ERT reiterates the recommendation in the previous review report that the Czech Republic improve its reporting by applying a tier 2 methodology for estimating emissions for this key category. In addition, the ERT recommends that the Party increase the transparency of its reporting by providing details of the flows of blast furnace gas between pig-iron production and steel production. The ERT further recommends that the Party establish a full carbon balance to calculate CO_2 emissions for the iron and steel production category and report the carbon balance in its next annual submission.

Consumption of halocarbons and SF_6 – HFCs and PFCs

63.   The Czech Republic has reported the AD for HFC and PFC emissions from operating systems (average annual stocks) as "NE". The Party informed the ERT that the AD needed for the estimation of emissions of some gases are not available in the national statistics or customs records. The ERT reiterates the recommendation made in the previous review report that the Czech Republic improve the transparency of its reporting by including the AD on the average annual stock of fluorinated gases (F-gases) and by providing the parameters used for estimating these gases in its next annual submission.

64.   The ERT noted that the Czech Republic has reported emissions of HFCs and PFCs from the disposal of electrical equipment as "NO". In response to a question raised by the ERT during the review, the Party explained that the data sources for these categories are the national customs registry and a nationwide information system for the collection and

assessment of data on environmental pollution in the Czech Republic called ISPOP. The Party also explained that it is working on acquiring AD on F-gas emissions from the decommissioning of various devices. Currently, such emissions are accounted for as a portion of the annual emissions on the basis of expert judgement. The ERT recommends that the Czech Republic improve its inventory by reporting AD and using the appropriate notation key for these emissions in its next annual submission.

3. Non-key categories

Glass production – CO_2

65.   The ERT noted that the Czech Republic used AD on manufactured glass to estimate emissions from glass production, without taking into account the quantity of recycled glass used as raw material. In response to a question raised by the ERT during the review, the Party informed the ERT that it is difficult to obtain data on recycled glass. The ERT encourages the Czech Republic to enhance the completeness and transparency of its reporting by taking into account the quantity of recycled glass in determining the aggregate EF used to estimate CO_2 emissions for this category.

Ammonia production – CO_2

66.   Following the recommendation in the previous review report, the Czech Republic has provided a separate section on ammonia (NH_3) production in its 2012 annual submission. The ERT acknowledges the Party's efforts to improve the transparency of its reporting. The ERT noted that the emissions from ammonia production were calculated from the amount of ammonia produced using a technology-specific EF of 2.4 Gg CO_2/Gg NH_3, which was derived from a technical report by Markvart and Bernauer (2005–2010). The ERT also noted that the Party's EF is higher than the IPCC default value of 1.5 Gg CO_2/Gg NH_3. The ERT commends the Czech Republic for improving the transparency of its estimation of CO_2 emissions from ammonia production by providing a separate section in the NIR on ammonia production, but recommends that the Party enhance transparency further in its next annual submission by providing the rationale in the NIR for why the EF is significantly higher than the IPCC default.

Other (chemical industry) – CH_4

67.   Following the recommendation in the previous review report, the Czech Republic has reported estimates of emissions from carbon black, dichloroethylene and styrene production for the period 1990–2007 in its 2012 annual submission. The ERT noted that this has improved the completeness of the reporting on emissions from the industrial processes sector. The ERT commends the Czech Republic for this improvement.

Electrical equipment – SF_6

68.   The Czech Republic estimated SF_6 emissions from electrical equipment using a tier 3a method that is based on information on the life cycle of the equipment. The ERT commends the Party for this improvement and recommends that it include information on the estimation methodology used in its next annual submission. The ERT noted that, when using such a method, the SF_6 is usually considered to be of high purity. However, the Party has not provided any information on its assumptions. The ERT reiterates the recommendation in the previous review report that the Czech Republic include in its next annual submission an explanation of how the purity of the SF_6 remaining in products is calculated.

69.   The ERT also noted that emissions from the disposal or decommissioning of electrical equipment were reported as "NE" by the Party. In response to a question raised by the ERT during the review, the Czech Republic informed the ERT that it is planning to

enhance the capacities of its national inventory system team to enable it to complete the reporting for this category. The ERT recommends that the Party review the disposal or decommissioning practices, such as destruction and/or recycling of SF_6, and include all information in the NIR, along with any applicable notation keys in its next annual submission, with the aim of enhancing the accuracy and transparency of the reporting.

D. Agriculture

1. Sector overview

70. In 2010, emissions from the agriculture sector amounted to 7,964.57 Gg CO_2 eq, or 5.7 per cent of total GHG emissions. Since 1990, emissions have decreased by 50.9 per cent. The key drivers for the fall in emissions are the decreases in the livestock population and the amount of synthetic fertilizer applied to soils. Within the sector, 61.4 per cent of the emissions were from agricultural soils, followed by 25.1 per cent from enteric fermentation. The remaining 13.6 per cent were from manure management.

71. The Czech Republic has made recalculations for the agriculture sector between its 2011 and 2012 annual submissions following changes in AD. The impact of these recalculations on the agriculture sector is a decrease in the estimate of emissions for 2009 of 4.9 per cent. The main recalculations took place in the following categories:

(a) Enteric fermentation, owing to the use of updated AD for livestock population and country-specific data, which resulted in a decrease in the estimate of emissions for 2009 by about 13.1 per cent compared with that reported in the Party's 2011 annual submission;

(b) Manure management and agricultural soils, following the evaluation of the national manure management systems. The recalculations resulted in a decrease in the estimates of emissions for 2009 by 7.1 per cent and 0.5 per cent, respectively, from manure management and agricultural soils.

72. During the review, the ERT discussed with the Party the availability of national statistical information on the production of N-fixing forage crops, potatoes and sugar beet. In response to the list of potential problems and further questions raised by the ERT during the review week, the Party revised the estimates of N_2O emissions from N-fixing crops and from crop residues returned to soils. The revisions resulted in an increase in the estimate of emissions from the agriculture sector by 2.4 per cent, or from 7,777.33 Gg CO_2 eq to 7,964.57 Gg CO_2 eq, for 2010. The ERT agrees with the revisions and commends the Czech Republic for its efforts to increase the accuracy of its reporting.

73. The Party has followed the recommendation in the previous review report and implemented a sector-specific QA/QC plan for the agriculture sector. The activities undertaken under that QA/QC plan have been described in the NIR. The ERT commends the Czech Republic for these improvements.

2. Key categories

Enteric fermentation – CH_4

74. The Czech Republic used a tier 2 approach to estimate CH_4 emissions from enteric fermentation for cattle and a tier 1 approach and default EFs from the Revised 1996 IPCC Guidelines to calculate the corresponding emissions for other livestock categories. This is in accordance with the IPCC good practice guidance. The Party has recalculated the estimates of emissions from enteric fermentation for cattle, owing to the use of country-specific values for feed digestibility. The recalculations performed resulted in a decrease in

the estimate of CH_4 emissions for 2009 of 13.1 per cent as compared with that reported in the 2011 annual submission. The ERT welcomes the improvements made.

Manure management – CH_4 and N_2O

75.   The Czech Republic used a tier 1 method and the EFs recommended for the manure management systems of Western Europe for cattle and swine and the EFs recommended for the manure management systems of developed countries for other livestock categories to estimate CH_4 emissions from manure management. Noting that this is a key category by trend, the ERT reiterates the recommendation in the previous review report that the Party use, in line with the IPCC good practice guidance, a higher-tier method to estimate emissions for this category for its next annual submission. The ERT also reiterates the recommendation in the previous review report that the Party, in particular, determine the amount of manure stored in the animal waste management system, which is used to estimate N_2O emissions from manure management, and the actual storage time of the manure.

76.   The Czech Republic has followed the recommendation in the previous review report and corrected the inconsistency in the number of grazing days used to estimate CH_4 and N_2O emissions from manure management. The ERT welcomes the improvements made and encourages the Czech Republic to improve the transparency of its reporting by documenting in detail, in its next annual submission, the number of grazing days used in the estimations for the entire reporting period.

77.   The Czech Republic used a tier 2 method to estimate N_2O emissions from manure management for cattle and a tier 1 method to calculate the emissions from manure management for other livestock categories and poultry. This is in accordance with the IPCC good practice guidance. The Party has recalculated the N excretion rates for dairy and non-dairy cattle and has evaluated and applied a national system for animal waste manure management. The ERT welcomes the improvements made and encourages the Czech Republic to improve the transparency of its reporting by documenting in detail, in its next annual submission, the national conditions (e.g. values of nitrogen intake with feed, and protein content of milk) taken into account in the estimation of N excretion rates. The recalculations performed resulted in a decrease in the estimate of N_2O emissions from manure management for 2009 of 7.6 per cent as compared with that reported in the 2011 annual submission.

Direct soil emissions – N_2O

78.   The ERT noted that the Czech Republic did not include N-fixing forage crops, such as alfalfa and clover, in the calculation of direct N_2O emissions for the entire time series. This is not in line with the IPCC good practice guidance, which provides relevant information on crop-residue ratios and EFs for these crops. In response to the list of potential problems and further questions raised by the ERT during the review week, the Party calculated N_2O emissions from N-fixing forage crops, such as alfalfa and clover, for the entire time series and included the estimates in its inventory. The revision resulted in an increase in the estimate of N_2O emissions from N-fixing crops for 2010 from 0.09 Gg N_2O to 0.67 Gg N_2O. The ERT agrees with the revised emission estimates and commends the efforts of the Czech Republic to improve the accuracy of its reporting.

79.   During the review, the ERT noted that the Czech Republic had not included potatoes and sugar beet crop in the estimation of the emissions from crop residues returned to soils for the entire time series. This is not in line with the IPCC good practice guidance, which provides relevant information on crop-residue ratios and EFs for potatoes and sugar beet crop. In response to the list of potential problems and further questions raised by the ERT during the review week, the Party calculated N_2O emissions from potato and sugar beet residues left on fields for the entire time series and included the estimates in its inventory.

The revision resulted in an increase in the estimate of N_2O emissions from crop residues for 2010 from 2.28 Gg N_2O to 2.30 Gg N_2O. The ERT agrees with the revised emission estimates and commends the efforts of the Czech Republic to improve the accuracy of its reporting.

80.   The ERT noted that the Czech Republic has data available on sewage sludge used on agricultural soils, which could be used to estimate direct N_2O emissions. It should be noted that the Party has reported all emissions from municipal sewage treatment in the wastewater handling category under the waste sector. To ensure consistency with the IPCC good practice guidance and to avoid double counting of emissions, the ERT recommends that the Czech Republic improve its internal coordination by ensuring appropriate communication between the waste and agriculture experts responsible for estimating N_2O emissions from sewage sludge application to agricultural soils, and that it report the emission estimates under the agriculture sector in its next annual submission.

81.   In addition, the ERT reiterates the following recommendations from the previous review report:

        (a)   The Czech Republic used a tier 1 approach to estimate N_2O emissions from crop residues returned to soils. The ERT recommends that the Party increase the transparency of its reporting by providing further documentation on country-specific AD and on the national circumstances influencing these data;

        (b)   The ERT agrees with the revised estimate for pasture, range and paddock provided in the 2012 annual submission, commends the Czech Republic for this improvement to the inventory and recommends that it document the methodology used and the number of grazing days in its next annual submission;

        (c)   The Czech Republic estimated N_2O emissions from atmospheric deposition. The ERT recommends that the Party increase the transparency of its reporting by providing further documentation on the methodology used for the estimations, including values of volatized nitrogen, in its next annual submission;

        (d)   The Czech Republic estimated N_2O emissions due to nitrogen leaching and run-off. The ERT recommends that the Party improve the transparency of its reporting by providing further documentation on the methodology used and values for the nitrogen lost through leaching and run-off in its next annual submission;

        (e)   The ERT recommends that the Czech Republic streamline and harmonize its reporting of ammonia emissions under different international bodies by using the *EMEP/EEA*[9] *Air Pollutant Emission Inventory Guidebook* or by using well-documented national data.

E.   Land use, land-use change and forestry

1.   Sector overview

82.   In 2010, net removals from the LULUCF sector amounted to 5,518.50 Gg CO_2 eq. Since 1990, net removals have increased by 52.5 per cent. While there is significant inter-annual variability in the amount of wood harvested on forest land remaining forest land, the key driver for the rise in removals is the steady increase in carbon removals from the biomass pool in the category forest land remaining forest land. Within the sector, 5,440.10 Gg removals were from forest land, followed by 371.32 Gg removals from grassland, 138.90 Gg emissions from cropland, 117.51 Gg emissions from settlements and 34.25 Gg emissions from wetlands. The removals from the LULUCF sector offset 4.0 per cent of the national GHG emission total in 2010, whereas in 1990 they offset 1.8 per cent of the national total.

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[9] EMEP: European Monitoring and Evaluation Programme; EEA: European Environment Agency.

83.   The Czech Republic has not made any recalculations for the LULUCF sector between its 2011 and 2012 annual submissions. However, the Party has reported emissions from lime application to forest land in the category other (LULUCF) in its 2012 annual submission (previously not included in the reporting under the Convention). Consequently, the estimates of total removals from the LULUCF sector for all the previous years reported in the 2011 and 2012 annual submissions are different. The ERT commends the Party for this revision, as it improves the transparency and completeness of the inventory.

84.   The reporting on the LULUCF sector is complete in terms of categories, carbon pools and gases. However, in some cases (e.g. mineral soil carbon stocks for wetlands and settlements remaining settlements), carbon stock changes in certain pools have been reported as "NO", when it is reasonable to assume that such changes would have occurred. In response to a question raised by the ERT during the review, the Party explained that the use of the notation key "NO" reflects the fact that there are no estimation methods provided in the IPCC good practice guidance for LULUCF for these pools and categories. The ERT recognizes that, while it is not mandatory to report on categories for which estimation methods are not available in the IPCC good practice guidance for LULUCF, they should be reported as "NE" rather than "NO". The ERT recommends that the Party examine all cases in which carbon stock changes in pools have been reported as "NO" for different land-use categories and report them using other appropriate notation keys in its next annual submission, in order to improve the transparency of the inventory.

85.   Following recommendations in the previous review report, the Czech Republic has made some improvements to the uncertainty assessment for the LULUCF sector by refining the methods used and utilizing some country-specific values available from the recently conducted statistical landscape inventory of the Czech Republic (CzechTerra) together with default uncertainty values from the IPCC good practice guidance for LULUCF. The ERT commends the Party for these improvements and encourages it to continue to further improve the uncertainty assessment for the LULUCF sector by using more country-specific values and exploring the possibility of using a tier 2 method based on the Monte Carlo method for its next annual submission.

86.   As noted in the previous review report, the Czech Republic has made great efforts to provide a complete series of land-use change matrices for 1990 onwards. However, the present ERT noted inconsistencies in the land-use change matrices due to discrepancies between the values for the initial and final areas for different land-use categories reported for consecutive years. For example, for grassland, the final area in 1990 and the initial area in 1991 are given as 878.2 kha and 877.4 kha, respectively, whereas they should be the same. In response to questions raised by the ERT during the review, the Party indicated that this was due to errors associated with the reconciliation of older land-use information with the recent, more accurate information. The ERT recommends that the Czech Republic provide additional, transparent information in its NIR clarifying the origin of the observed residual discrepancies in land-use areas, in order to improve the transparency of its LULUCF inventory in the next annual submission.

87.   As noted in the previous review report, the Czech Republic has used a single set of default stock change factors (F_{LU}=1, F_{MG}=1.08 and F_I=1) to obtain spatially averaged values for the carbon stock of mineral soils for annual and woody crops. In the IPCC good practice guidance for LULUCF, these stock change factors correspond to annual crops with reduced tillage and medium input. In response to a question raised by the ERT during the review, the Party clarified that it used these factors in combination with the country-specific reference carbon stock values that were derived from detailed maps of soil carbon stock. The reference carbon stock values derived from the soil carbon map have been described in the NIR and differ across the country by soil type, altitude, land-use history, etc. However, the reasons for using a single set of stock change factors for the entire country were not clearly explained in the NIR. Some of the issues associated with using the Party's approach

are: the stock change factors given in the IPCC good practice guidance for LULUCF are meant to be used with the default reference carbon stock values and countries are supposed to develop and use their own country-specific stock change factors for the tier 2 method; and, as pointed out in the previous review report, using a common set of stock change factors for all cropland areas at the cadastral level reduces the accuracy of the estimation of carbon stock changes by not considering the specific management of and input regimes applied to various soil types and their changes within a cadastral unit. The ERT recommends that the Czech Republic improve the accuracy of its estimates of the carbon stock changes in mineral soils by subdividing the cropland areas within cadastral units by the tillage and input regimes and associating country-specific stock change factors with them. The ERT also recommends that the Czech Republic include transparent information in the NIR of its next annual submission on how the mineral soil carbon stocks for cropland were derived, with a detailed description of the methodology, assumptions and country-specific reference carbon stock values for some representative conditions.

88.   The NIR contains some general information on the QA/QC procedures adopted for different categories in the LULUCF sector. However, no information on the sector- and category-specific QA/QC procedures has been provided in the NIR. The ERT recommends that the Czech Republic provide transparent information on the category- and sector-specific QA/QC procedures followed in its next annual submission.

1.   Key categories

Forest land remaining forest land – CO_2

89.   The Czech Republic has not explicitly accounted for biomass lost due to natural disturbances on forest land remaining forest land. The NIR, however, mentions that forests, especially coniferous forests, are affected by wind throws, snow and bark beetle attacks. The biomass losses due to natural disturbances are taken into account by including them in the biomass losses due to harvest, by increasing the harvest volumes by 5 per cent for planned forest harvest operations and 15 per cent for salvage logging. However, no basis for these assumed values has been provided in the NIR. It is important to note that only a very small fraction of the biomass lost due to natural disturbances is normally recoverable by way of salvage logging and the assumption of the aforementioned values could potentially lead to the underestimation of emissions from natural disturbances. In response to questions raised by the ERT during the review, the Party explained that, in order to make the reporting more transparent, it would consider adding in the next NIR a table containing the officially reported harvest volume by main tree species group together with estimates of additional volume loss for the entire reporting period since 1990. The ERT recommends that the Czech Republic either include, in its next annual submission, transparent information supporting its assumed values or, alternatively, use the actual information on areas subject to natural disturbances together with their biomass stocks to estimate the biomass losses due to natural disturbances.

90.   The Czech Republic has applied the tier 1 assumption from the IPCC good practice guidance for LULUCF and assumed that carbon stocks in dead organic matter are constant. However, as forest land remaining forest land is a key category, it is not good practice to apply that assumption. In response to questions raised by the ERT during the review, the Party informed the ERT that it does not currently have suitable quantitative data to estimate carbon stock changes in dead organic matter using a higher-tier approach. This is expected to change once the country-level statistical forest inventory, which is currently ongoing, has been completed, which will allow the use of the stock change estimation method. The ERT believes that there could potentially be significant stock changes in the dead organic matter carbon pool for forest land remaining forest land owing to the fact that harvest volumes have fluctuated significantly over the entire time series, and recommends that the Czech

Republic use the results of the national forest inventory, when they are available, to estimate the carbon stock changes in the dead organic matter pool.

91.   The Czech Republic has applied the tier 1 assumption from the IPCC good practice guidance for LULUCF and assumed the carbon stocks in mineral soils to be constant. However, as forest land remaining forest land is a key category, it is not good practice to apply that assumption. In response to questions raised by the ERT during the review, the Party explained that carbon stock changes in the mineral soil carbon pool have not been estimated because organizing repeated country-level quantitative mineral soil carbon inventories with a high level of accuracy is highly resource-intensive and it has evidence from peer-reviewed studies that, under sustainable forest management, there is no loss of carbon stock in mineral soils. The ERT recommends that the Czech Republic provide transparent information on these peer-reviewed studies, clearly mentioning their conclusions, in the next annual submission.

2.   Non-key categories

Land converted to forest land – CO$_2$

92.   The Czech Republic has considered the biomass losses for land converted to forest land to be insignificant as there is no harvesting on such land and the first thinning losses take place in older age-classes of forest. However, there is no explanation provided in the NIR for not including in the estimation methodology biomass losses due to natural disturbances for land converted to forest land. In response to a question raised by the ERT during the review, the Party indicated that natural disturbances are assumed to affect only the older forest stands in the country, as no disturbance has been reported for forest stands up to 20-years old and only the older forests are susceptible to disturbances, including wind, fungal disease and bark beetle attacks. The ERT recommends that the Party, for its next annual submission, either estimate the carbon stock changes in land converted to forest land by collecting information on the area of young forest stands affected by natural disturbances, or provide transparent information substantiating the assumption that areas of younger age-classes of forests are not affected by natural disturbances.

93.   The Czech Republic estimated the above-ground biomass increment for land converted to forest land using the area weights for the main tree species for forest land remaining forest land, owing to the fact that the specific species composition of the newly converted land is unknown. This could potentially lead to the underestimation or overestimation of the mean biomass increment for land converted to forest land, depending on the species composition of the areas of land converted to forest land, since biomass increment varies significantly by species. In response to questions raised by the ERT during the review, the Party explained that, since land converted to forest land is scattered across the entire country and subject to a range of conditions, the species composition of that land is likely to resemble that of the entire forest land, because the species composition of such land is subject to the prescriptions and recommendations of the Czech Forest Act. However, the Party plans to further examine the biomass increment values for young forest stands up to the age of 20-years once the results of the repeated statistical forest inventory are available. The ERT recommends that the Czech Republic revise the biomass increment value for land converted to forest land used to estimate the carbon stock changes in the biomass pool for land converted to forest land, once the relevant information from the ongoing national forest inventory campaign is available.

F. Waste

1. Sector overview

94.   In 2010, emissions from the waste sector amounted to 3,611.79 Gg CO_2 eq, or 2.6 per cent of total GHG emissions. Since the base year, emissions have increased by 35.1 per cent. The key driver for the rise in emissions is the increase in CH_4 emissions from solid waste disposal on land induced by the increase in the amount of landfilled solid organic waste. Within the sector, 75.0 per cent of the emissions were from solid waste disposal on land, followed by 19.9 per cent from wastewater handling and 5.1 per cent from waste incineration.

95.   The Party has made recalculations for the waste sector between its 2011 and 2012 annual submissions in response to the 2011 ARR, following changes due to improved and updated AD and EFs and also owing to the reallocation of emissions from incinerated municipal solid waste with energy recovery to the energy sector in accordance with the IPCC good practice guidance. The impact of these recalculations on the waste sector is a decrease in the estimate of emissions for 2009 of 0.7 per cent. The main recalculations took place in the following categories:

        (a)   Solid waste disposal on land (CH_4), owing to improved AD and EFs (estimated CH_4 emissions increased by 84.82 Gg CO_2 eq or 3.4 per cent);

        (b)   Waste incineration (CO_2, CH_4 and N_2O), owing to the reallocation of emissions from incinerated municipal solid waste with energy recovery to the energy sector (estimated CO_2, CH_4 and N_2O emissions decreased by 111.23 Gg CO_2 eq or 35.4 per cent).

96.   The ERT noted that fundamental descriptions and/or key elements of some of the key parameters, such as data sources, methods, rationale and relevant background information, used to calculate emission estimates for the waste sector have not been transparently documented in the NIR. The ERT recommends that the Party include more detailed explanations in its next annual submission, in order to improve the transparency of its reporting and to ensure time-series consistency (see para. 99 below).

97.   The ERT noted significant inter-annual changes or fluctuations in the sectoral AD and emission trends, such as in the amount of municipal solid waste disposal in solid waste disposal sites, provided in NIR table 8-2: 1998–1999 (–6.1 per cent), 1999–2000 (+6.5 per cent) and 2009–2010 (–6.5 per cent). It also noted the rapid increase in the N_2O emission estimates from wastewater handling for 1999–2000 (25.0 per cent) and the fluctuations in the CH_4 emission estimates from the same category for 2000–2001 (–3.6 per cent), 2001–2002 (+7.3 per cent) and 2002–2003 (–7.8 per cent). These changes and fluctuations are not adequately explained in the NIR. The ERT recommends that the Party provide supporting explanations for such trends in its next annual submission, in order to improve the transparency of its reporting and to ensure time-series consistency.

98.   The NIR states that the QA/QC plan for the waste sector has been updated on the basis of recommendations in the previous review report and in cooperation with the sector-specific institutions, and implemented in compiling the 2012 annual submission. However, the ERT noted that there were no adequate descriptions with regard to what level (tier) of QA/QC activity was conducted for the sector and the details of QA/QC procedures, particularly for key categories. The ERT reiterates the recommendation in the previous review report that the Party document its QA/QC procedures for the entire sector more systematically, in particular for the key categories, and describe them in the NIR of its next annual submission. The ERT also recommends that the Party strengthen its QC procedures in order to eliminate errors, such as the inconsistency identified during the review in the data between CRF table 6.B and table 8-7 of the NIR, for its next annual submission.

99.   The ERT noted that the NIR describes that CH_4 recovery from anaerobic sewage sludge digestion is taking place in the country; however, it does not include a clear and adequate explanation of how residual organic matter produced in this digestion process is treated. In response to a question raised by the ERT during the review on the disposal and incineration of sewage sludge in the country and the emissions therefrom, the Party informed the ERT that no such activities were occurring in the country. However, during the review, the ERT received relevant information from the Party relating to the agriculture sector which indicated that some landfilling and incineration of digested sewage sludge does occur. In response to further questions raised by the ERT during the review, the Party provided information demonstrating that every wastewater treatment plant in the country must have a sludge treatment facility (sludge digestion) under national law and that emissions from incineration of digested sewage sludge are accounted for under waste incineration. The ERT strongly recommends that the Party provide, in its next annual submission, a general description of the sewage sludge treatment stream across subcategories within the waste sector and information on how the relevant emissions are accounted for, in order to improve the transparency and ensure the completeness of its reporting.

2. Key categories

Solid waste disposal on land – CH_4

100. CH_4 emissions from solid waste disposal on land was identified as a key category according to both the level and trend assessment. The Party applied the tier 2 first order decay method provided in the 2006 IPCC Guidelines to estimate CH_4 emissions from municipal solid waste disposed of in managed landfill sites. During the previous review, the Party informed the ERT that it had completed the collection of waste composition data for the years 1975, 1985–1987, 1997, 2000 and 2008–2010 and intended to use the data for its next annual submission. However, the current NIR states that the Party collected country-specific waste composition data for 2001 and the period 2005–2010, used the IPCC default values for Eastern Europe for the period 1990–1995 and interpolated the data for the periods 1996–2000 and 2002–2004. Consequently, recalculations of the entire time series were conducted in order to improve the accuracy of its reporting and to reduce the uncertainty of the estimates of CH_4 emissions from managed solid waste disposal sites. The ERT commends the Party for its efforts. However, the ERT recommends that the Party provide, in its next annual submission, more clear and detailed information on how it obtained the above-mentioned historical data and how the time-series consistency of the data was ensured, particularly for the period prior to 1990, in order to improve the transparency and consistency of its reporting.

101.   The Party recalculated the amount of municipal solid waste disposed of in managed landfill sites and CH_4 recovery because improved historical data on annual municipal solid waste disposal for the period 1992–2010 and the amount of CH_4 recovery for the period 1990–2010 became available. The ERT commends the Party for its effort; however, the ERT noted that adequate information on the data sources and methods used for said improvement and the rationale behind it have not been provided in the NIR. In response to a question raised by the ERT during the review requesting more details on the assumptions used to estimate historical data on annual municipal solid waste disposal in managed landfill sites for the period 1950–2010 by period, sources of data or estimation methods, the Party provided the ERT with a very brief summary of the assumptions as well as the source of the information, which were not indicated in the NIR. The ERT recommends that the Party include more detailed explanations for this category in its next annual submission, in order to improve the transparency of its reporting. Also, in response to a question raised by the ERT during the review regarding how the figures for CH_4 recovery shown in NIR table 8-6 were obtained, the Party provided the ERT with a table of data on the aggregated

amount of CH_4 recovery obtained from the Ministry of Trade and Industry. The ERT recommends that the Party include more detailed explanations regarding the assumptions used to obtain the figures for CH_4 recovery, such as the number of CH_4 recovery facilities and the fraction of CH_4 in landfill gas collected, in its next annual submission, in order to improve the transparency of its reporting.

102.   In response to a question raised by the ERT during the review regarding the significant increase (by 758.7 per cent) in the amount of CH_4 recovered over the period 1990–2010, the Party informed the ERT that the drastic changes in its waste administration policies and waste management practices contributed to said increase. The ERT recommends that the Party include in its next annual submission such supporting information to explain this significant increase in CH_4 recovery, in order to improve the transparency of its reporting.

103.   The ERT noted that the NIR does not contain a general description of the sewage sludge treatment stream across subcategories within the waste sector. In response to questions raised by the ERT during the review regarding the disposal of digested sewage sludge, the Party informed the ERT that the results of the official waste composition survey conducted by the Party showed no presence of sewage sludge. However, since the process of anaerobic sewage sludge digestion is actually conducted in the country, and the landfilling of digested sewage sludge still generates CH_4 as a result of the decomposition of organic matter under anaerobic conditions at solid waste disposal sites, the ERT recommends that the Party provide in its next annual submission clear and adequate explanations, including the results of official investigations, of where residual organic matter produced in the anaerobic digestion process is taken and how it is treated, other than its disposal at solid waste disposal sites, in order to improve the transparency and completeness of its reporting.

104.   The ERT noted that the NIR does not contain a general description of industrial waste management in the country. In response to a question raised by the ERT during the review regarding the activity of industrial waste disposal, the Party informed the ERT that the emissions from industrial waste are included under total managed waste disposal on land. The ERT reiterates the recommendation in previous review reports that the Party include all of the sources of the AD and parameters used for estimating the emissions from solid waste disposal on land in its next annual submission, in order to improve the transparency of its reporting.

3.   Non-key categories

Wastewater handling – CH_4 and N_2O

105.   The Party applied the methodology from the Revised 1996 IPCC Guidelines, using mostly default values and country-specific CH_4 conversion factors reflecting the current wastewater handling technologies used in the country, to estimate CH_4 emissions for this category. The ERT identified a disagreement and inconsistency in the sectoral background data between CRF table 6.B and table 8-7 of the NIR and recommends that the Party review and strengthen its QC procedures, in order to eliminate such errors, for its next annual submission.

106.   The ERT noted the rapid 25.0 per cent increase in the estimated N_2O emissions from human sewage between 1999 and 2000, which has not been explained in the NIR. The ERT recommends that the Party provide supporting explanations for this trend, including significant inter-annual changes or fluctuations in AD or emissions, in its next annual submission, in order to improve the transparency of its reporting and to ensure time-series consistency.

<u>Waste incineration – CO_2, CH_4 and N_2O</u>

107.   Following the recommendation in the previous review report, the Party has reported emission estimates for waste incineration with energy recovery under the energy sector. The Party has reported emission estimates for biogenic and non-biogenic waste separately. The ERT commends the Party for its efforts. However, the ERT noted that the NIR provides limited descriptions of the methods, data sources and assumptions used to estimate emissions from waste incineration with energy recovery and reiterates the recommendation in previous review reports that the Party transparently document this information in its next annual submission, in order to improve the transparency of its reporting.

108.   The ERT noted that the NIR does not contain a general description of the sewage sludge treatment stream across subcategories within the waste sector. In response to questions raised by the ERT during the review on the activity of sewage sludge incineration, the Party provided information demonstrating that every wastewater treatment plant in the country must have a sludge treatment facility (sludge digestion) under national law (because of its hygienic and chemical instability, sewage sludge can only be incinerated in hazardous waste facilities) and that emissions from incineration of digested sewage sludge, estimated using an aggregated EF for hazardous waste, are accounted for under waste incineration, since there is no source of information on the composition of incinerated waste. The ERT recommends that the Party provide clear and adequate information in its next annual submission, including a general description of the sewage sludge treatment stream across subcategories and information on how relevant emission estimates are accounted for, in order to improve the transparency and completeness of its reporting.

<u>Other (waste) – CO_2, CH_4 and N_2O</u>

109.   The ERT noted that estimates of carbon monoxide, nitrogen oxide, NMVOC and sulphur dioxide emissions from other (waste) have been reported in the CRF tables in the Party's 2012 annual submission, while CO_2, CH_4 and N_2O emissions for the category have been reported as not applicable; however, no descriptions of this subcategory have been provided in the documentation box of the relevant CRF table or in the NIR. The ERT recommends that the Party provide sufficient information and documentation for this category, including the emission sources, in its next annual submission, in order to improve the transparency of its reporting.

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

<u>Overview</u>

110.   The Czech Republic provided supplementary information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, following the requirements outlined in decision 15/CMP.1, annex, paragraphs 5–9. The information corresponding to the years 2008, 2009 and 2010 was reported in the KP-LULUCF CRF tables and in chapter 11 of the NIR, following the annotated outline of the NIR. The NIR clearly distinguishes the emissions from these activities from the emissions from sources listed in Annex A to the Kyoto Protocol.

111.   The Czech Republic elected to account for forest management only under Article 3, paragraph 4, of the Kyoto Protocol. The Party identified the units of land subject to afforestation, reforestation and deforestation and the land subject to forest management using reporting method 1 from the IPCC good practice guidance for LULUCF, with the national boundary being the geographical location of the boundaries of the areas that encompass these activities. The definition of forest and the land-identification system used

to determine the areas subject to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are in accordance with the IPCC good practice guidance for LULUCF. The Party has chosen commitment period accounting.

112.   The Party has not made any recalculations for the KP-LULUCF activities between its 2011 and 2012 annual submissions.

113.   The Czech Republic did not provide any information on how it ensures that afforestation and reforestation occurring on deforestation land is distinguished from afforestation and reforestation taking place on other land. This issue was raised in the previous review report, but the Party has not provided transparent information on this in its 2012 annual submission, owing to the delay in the finalization of the previous review report. The present ERT reiterates the recommendation in the previous review report that the Party provide transparent information in the NIR of its next annual submission.

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

Afforestation and reforestation – CO$_2$

114.   The Czech Republic has reported an area of 42.76 kha subject to afforestation and reforestation in 2010. The net removals due to this activity amounted to 322.26 Gg CO$_2$ eq, with an implied emission factor (IEF) of 7.54 Mg CO$_2$ eq/ha. The estimated areas and net removals reported for afforestation and reforestation are in agreement with those reported for land converted to forest land under the Convention.

115.   As highlighted in paragraphs 92 and 93 above, for land converted to forest land and, consequently, for areas of afforestation and deforestation, biomass losses are considered insignificant, as there is no harvesting on such land and the first thinning losses take place in older age-classes of forest. However, the ERT concludes that there might be biomass losses due to natural disturbances that have not been taken into account. Following the recommendation referred to in paragraph 93 above, the ERT recommends that the Czech Republic reflect the recommended revisions, once the relevant information from the ongoing national forest inventory campaign is available.

Deforestation – CO$_2$

116.   The Czech Republic has reported an area of 14.04 kha subject to afforestation and reforestation in 2010. The net emissions due to this activity amounted to 206.45 Gg CO$_2$ eq, with an IEF of 14.70 Mg CO$_2$ eq/ha. The estimated areas and net emissions reported for deforestation are in agreement with those reported under the Convention.

117.   The emissions reported for units of land subject to deforestation are due to biomass losses in the areas of forest land converted to other land uses in the last year and, to a lesser extent, to decreases in the carbon stock of the soil organic carbon pool due to forest land conversions in the previous years of the time series. As highlighted in the previous review report, the previous ERT concluded that the Party's land-representation system does not enable it to track all of the land-use and management changes on the units of land subject to deforestation, which may lead to an inaccurate estimation of the emissions or removals other than those related to losses of carbon currently estimated by the Czech Republic. The present ERT noted that the Party has not made any improvements to its land-representation system in response to the recommendation in the previous review report owing to the delay in the finalization of that review report. The present ERT therefore reiterates the recommendation in the previous review report that the Party improve the tracking of deforested lands by including information on subsequent land-use changes and the management practices applied to them, in order to enhance the accuracy of the emission and removal estimates, in its next annual submission.

Activities under Article 3, paragraph 4, of the Kyoto Protocol

Forest management – CO_2

118.   The Czech Republic has reported an area of 2,561.47 kha subject to forest management in 2010. The net removals due to this activity amounted to 5,096.22 Gg CO_2 eq, with an IEF of 2.04 Mg CO_2 eq/ha. The estimated areas and removals reported for forest management are in agreement with those reported under the Convention.

119.   The Party has adopted a broad definition of forest management and included all of the country's managed forests under land subject to forest management, providing the necessary justification of the 'human-induced' nature of the forest management.

120.   The Czech Republic has not reported carbon stock changes in the dead wood, litter and soil carbon pools for forest management, providing evidence that they are not net sources of emissions. Considering that forest management is a key category, the present ERT reiterates the encouragement in the previous review report that the Party estimate the carbon stock changes in these pools by developing and using higher-tier methods, with a view to making the inventory consistent with the requirements of the IPCC good practice guidance.

121.   It is stated in the NIR that burning is restricted to forest management land only, based on the reporting on forest land remaining forest land under the Convention. However, the ERT noted that some land converted to forest land (that converted to forest land in 1990) was moved to the forest land remaining forest land category this year, but will continue to be reported under land subject to afforestation and reforestation under the Kyoto Protocol. In response to a question raised by the ERT during the review regarding the justification of the assumption that burning is confined to forest management land only, the Party indicated that burning, as a part of the Czech Republic's forest management practices, is still partly practised in connection with final harvest, when land is prepared for new planting and regeneration, which, according to the Czech Republic's Forest Act, is when the forest is 70-years or more for the dominant tree species in the Czech Republic, Norway Spruce. The ERT recommends that the Party include transparent information on this in its next annual submission.

2.   Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

122.   The Czech Republic 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 and the recommendation included in the 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 and recommendation contained in the SIAR.

123.   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

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[10]   The SEF comparison report is prepared by the 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.

discrepancy has been identified by the ITL and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

National registry

124. The ERT took note of the SIAR and its finding that the reported information on the national registry is complete and has been submitted in accordance with the annex to decision 15/CMP.1. The ERT further noted from the SIAR and its finding that 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 decisions 16/CP.10 and 12/CMP.1. The national registry also has adequate security, data safeguard and disaster recovery measures in place and its operational performance is adequate. However, the SIAR identified the following problem: the Party's website is currently under reconstruction and it is strongly recommended that the Party promptly make all non confidential information public in accordance with paragraphs 44–48 of section II.E of the annex to decisions 13/CMP.1.

Calculation of the commitment period reserve

125. The Czech Republic has reported its commitment period reserve in its 2012 annual submission. The Party reported its commitment period reserve to be 668,196,835 t CO_2 eq, based on the national emissions in its most recently reviewed inventory (133,639,367 Gg CO_2 eq in 2010, including LULUCF). The ERT disagrees with this figure; its calculation of the commitment period reserve is 697,616,911 t CO_2 eq, based on the total GHG emissions in the Party's most recently reviewed inventory (139,523,382 t CO_2 eq in 2010). The ERT recommends that the Czech Republic include revised information on its commitment period reserve in its next annual submission.

3. **Changes to the national system**

126. The Czech Republic reported that there have been changes in its national system since the previous annual submission. The Party described the changes in its NIR, which consist of the recent development and implementation of a new QA/QC plan (see paras. 25 and 26 above), which can be considered as an important improvement in the national system, and a major staffing change involving a new coordinator of the national inventory. 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**

127. The Czech Republic reported that there have been changes in its national registry since the previous annual submission. The Party described the changes in its NIR, which are related to the implementation of several new security measures in the registry software at the beginning of 2011. The ERT concluded that, taking into account the confirmed changes in the national registry, the Czech Republic'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).

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

128. The Czech Republic reported that there have been no changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto

Protocol since the previous annual submission. The ERT concluded that the information provided continues to be complete and transparent.

129.   In its 2012 NIR, the Czech Republic has underlined that, being a member of the EU, the minimization of adverse impacts on developing countries is largely dictated by the European Commission's policy on climate change and by its policies and programmes affecting developing countries. Moreover, regulation at the European level controls or influences market conditions, fiscal incentives, tax and duty exemptions and subsidies in all economic sectors in EU member States. An impact assessment of new policy initiatives has been established in the EU, which allows their potential adverse social, environmental and economic impacts on various stakeholders, including developing country Parties, to be identified and limited at an early stage in the legislative process.

130.   In addition, in its NIR the Party has listed a series of country-specific national measures that limit subsidies (e.g. in agriculture) and deregulated many sectors of the national economy (e.g. electricity production). Moreover, in response to a question raised by the ERT during the review, the Czech Republic listed several cooperative initiatives with Parties not included in Annex I to the Convention, thereby updating the list provided in the NIR. The updated list includes projects in Bosnia and Herzegovina, Cambodia, Georgia and Viet Nam regarding the diffusion of new technologies and efficiency improvements related to fossil fuel use. Additionally, a document illustrating the new policy framework adopted by the Czech Republic for development cooperation was delivered to the ERT. The ERT recommends that the Party include this additional information in its next annual submission.

III.   Conclusions and recommendations

A.   Conclusions

131.   The Czech Republic made its annual submission on 15 April 2012. The annual submission contains the GHG inventory (comprising the CRF tables and an NIR) and supplementary information under Article 7, paragraph 1, of the Kyoto Protocol (information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, Kyoto Protocol units, changes to the national system and the national registry, and the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol). This is in line with decision 15/CMP.1. The Party officially submitted revised emission estimates on 19 October 2012 in response to the list of potential problems and further questions raised by the ERT during the review. This is in line with decision 15/CMP.1.

132.   The ERT concludes that the inventory submission of the Czech Republic has been prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is generally complete and the Party has submitted a complete set of CRF tables for the years 1990–2010 and an NIR; these are generally complete in terms of geographical coverage, years and sectors, as well as complete in terms of categories and gases. The ERT noted that the Czech Republic does not estimate SF_6 emissions from disposal and decommissioning of electrical equipment.

133.   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.

134.   The Party's inventory is in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. However, the ERT noted that a lack of resources continues to affect the accuracy and continuous improvement of the quality of the inventory by restricting the collection of additional data and the elaboration of higher-tier estimation methods for key categories in the following

sectors: industrial processes, agriculture, LULUCF and for KP-LULUCF activities. The Czech Republic is commended for the improvements in its reporting, inter alia: ensuring the consistency of the reporting between CRF table 7 and the NIR; properly allocating emissions between energy industries and manufacturing industries and construction; improving the consistency of the AD time series for categories under the energy sector (e.g. see para. 44 above); and revising emission estimates for the agriculture sector (see para. 75 above).

135.   The Party has made recalculations for the inventory between its 2011 and 2012 annual submissions in response to the 2010 and 2011 ARRs and following changes in AD. The impact of these recalculations on the national totals is an increase in the estimates of emissions for the base year and 2008 of 0.3 per cent and 1.6 per cent, respectively (2008 is deemed the most appropriate year to use for comparison, owing to the extensive changes implemented for the 2009 inventory). The recalculations took place in all the sectors excluding LULUCF.

136.   The Czech Republic elected to account for forest management only of the activities under Article 3, paragraph 4, of the Kyoto Protocol. The definition of forest and the land-identification system used to determine the areas subject to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are in accordance with the IPCC good practice guidance for LULUCF. The Party has chosen commitment period accounting.

137.   The Party has not made recalculations for the KP-LULUCF activities between its 2011 and 2012 annual submissions.

138.   The Czech Republic 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.

139.   The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1; however, the ERT remarked that the Czech Republic does not yet have a centralized archiving system and noted that a lack of resources continues to affect the accuracy and continuous improvement of the quality of the inventory by restricting the collection of additional data and the elaboration of higher-tier estimation methods for key categories (see para. 11 above).

140.   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 decisions of the CMP. However, the ERT identified the following problem: the Party's website is currently under reconstruction, resulting in non-confidential information not being made available to the public in accordance with decision 13/CMP.1, annex, chapter II.E, paragraphs 44–48.

141.   The Czech Republic has reported no changes in the information under decision 15/CMP.1, annex, chapter I.H, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", as part of its 2012 annual submission. The information provided is complete and transparent.

B.   Recommendations

142.   The ERT identifies issues for improvement as listed in table 6 below.

Table 6
Recommendations identified by the expert review team

Sector	Category	Recommendation	Paragraph reference
General	Overview	Strengthen the capacity of the national system so that the accuracy of the inventory can be improved by moving to higher-tier estimation methods and by fully implementing and maintaining the archiving system for the annual submissions	13
	Inventory planning	Resolve the issues of budget restrictions and staff shortages, prioritize the listed improvements on the basis of the key category and uncertainty analyses, and improve the transparency of the reporting on the improvements made	17
	Uncertainties	Establish and follow the procedure defined 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) for eliciting expert judgement, and provide documentation on the expert judgement used to derive the uncertainty values	23
	Transparency	Provide further details in the national inventory report (NIR) on the methods and emission factors (EFs) used for the calculation of emission estimates, as well as a description of the data sources and assumptions used	27
	Inventory management	Complete the implementation of a proper archiving system	28
Energy	Reference and sectoral approaches	Provide a detailed explanation of the differences between the data reported in the common reporting format (CRF) tables and the International Energy Agency data regarding jet kerosene consumption	41
	Feedstock and non-energy use of fuels	Provide documentation to substantiate the expert judgement applied in the use of a carbon storage factor of 80 per cent	43
	Stationary combustion: biomass – CH_4 and N_2O	Transparently document the methods used to estimate CH_4 and N_2O emissions from charcoal use	47
		Transparently document the methods used to estimate CH_4 emissions from charcoal production	48
	Road transportation: liquid fuels – CO_2	Use country-specific CO_2 EFs	49
	Coal mining and handling – CH_4	Provide a detailed explanation of how expert judgement is sought for the uncertainty analysis in relation to fugitive emissions from solid fuels and oil and natural gas systems	51
	Other transportation: liquid fuels – CO_2, CH_4	Revise the use of the notation key for not occurring ("NO") for liquid fuels in the subcategory other	52

Sector	Category	Recommendation	Paragraph reference
	and N_2O	transportation and replace it with the notation key for included elsewhere	
Industrial processes and solvent and other product use	Sector overview	Provide in the NIR an overall figure to demonstrate the impact of the recalculations undertaken for the industrial processes sector	55
		Provide more transparent information on the methodologies applied for estimating emissions from the industrial processes sector, particularly for the key categories	56
		Use the information provided in the IPCC good practice guidance and estimate emissions of SF_6 from the disposal or decommissioning of electrical equipment	57
		Improve the uncertainty estimates for the industrial processes sector, particularly for key categories, and report on the results of that work	58
	Iron and steel production – CO_2	Improve the reporting by applying a tier 2 estimation methodology	62
		Provide details of the flows of blast furnace gas between pig-iron production and steel production	
		Establish a full carbon balance to calculate CO_2 emissions and report this carbon balance	
	Consumption of halocarbons and SF_6 – HFCs and PFCs	Improve the transparency of the reporting by including the activity data (AD) on the average annual stock of fluorinated gases, and provide the parameters used for estimating those gases	63
	Ammonia production – CO_2	Enhance transparency further by providing a rationale in the NIR for why the EF is significantly higher than the IPCC default	66
	Electrical equipment – SF_6	Provide an explanation of how the purity of SF_6 remaining in products is calculated	68
		Review the disposal or decommissioning practices, such as destruction and/or recycling of SF_6, and include all information in the NIR, along with any applicable notation keys	69
Agriculture	Manure management – CH_4 and N_2O	Use, in line with the IPCC good practice guidance, a higher-tier method to estimate emissions	75
		Determine the amount of manure stored in the animal waste management system, which is used to estimate N_2O emissions from manure management, and the actual storage time of the manure	75
	Direct emissions – N_2O	Improve the internal coordination by ensuring appropriate communication between the waste and	80

Sector	Category	Recommendation	*Paragraph reference*
		agriculture experts responsible for estimating N_2O emissions from sewage sludge application to agricultural soils and report the emission estimates under the agriculture sector	
		Increase the transparency of the reporting by providing further documentation on country-specific AD and on the national circumstances influencing them	81(a)
		Document the methodology used and the number of grazing days	81(b)
		Provide further documentation on the methodology used in the estimations, including values of volatized nitrogen	81(c)
		Estimate N_2O emissions due to nitrogen leaching and run-off and provide further documentation on the methodology used and values for the nitrogen lost through leaching and run-off	81(d)
		Streamline and harmonize the reporting of ammonia emissions under different international bodies by using the *EMEP/EEA [11] Air Pollutant Emission Inventory Guidebook* or by using well-documented national data	81(e)
Land use, land-use change and forestry	Sector overview	Examine all cases in which carbon stock changes in pools have been reported as "NO" for different land-use categories and report them using other appropriate notation keys	84
		Provide additional transparent information clarifying the origin of the observed residual discrepancies in land-use areas	86
		Improve the accuracy of the estimates of carbon stock changes in minerals soils by subdividing the cropland areas within cadastral units by the tillage and input regimes and associating them with country-specific stock change factors	87
		Provide transparent information on the category- and sector-specific quality assurance/quality control (QA/QC) procedures followed	88
	Forest land remaining forest land – CO_2	Either include transparent information supporting the assumed values, or use the actual information on areas subject to natural disturbances together with their biomass stocks to estimate biomass losses due to natural disturbances	89
		Provide transparent information on peer-reviewed studies, clearly mentioning their conclusions	91

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[11] EMEP: European Monitoring and Evaluation Programme; EEA: European Environment Agency.

Sector	Category	Recommendation	Paragraph reference
	Land converted to forest land – CO_2	Either estimate the carbon stock changes by collecting information on the area of young forest stands affected by natural disturbances, or provide transparent information substantiating the assumption that areas of younger age-classes of forests are not affected by natural disturbances	92
		Revise the biomass increment value for land converted to forest land to estimate the carbon stock changes in the biomass pool for land converted to forest land, once the relevant information from the ongoing national forest inventory campaign is available	93 and 115
Waste	Sector overview	Include more detailed explanations in order to improve the transparency of the reporting and to ensure time-series consistency	96
		Provide supporting explanations for the significant inter-annual changes or fluctuations in the sectoral AD trends	97
		Document more systematically the QA/QC procedures for the entire sector and strengthen the QC procedures in order to eliminate the errors identified in the CRF tables	98
		Provide a general description of the sewage sludge treatment stream across subcategories within the waste sector and information on how the relevant emissions are accounted for	99
	Solid waste disposal on land – CH_4	Provide more clear and detailed information on how the historical waste composition data were obtained and how the time-series consistency of the data was ensured	100
		Provide more detailed explanations for AD and emission trends, including significant inter-annual changes or fluctuations	101
		Provide more detailed explanations regarding the assumptions used to obtain the figures for CH_4 recovery	101
		Provide supporting information to explain the significant increase in CH_4 recovery	102
		Provide clear and adequate explanations, including the results of official investigations, of where residual organic matter produced in the anaerobic digestion process is taken to and how it is treated, other than its disposal at solid waste disposal sites	103
		Include all of the sources of the AD and parameters used for estimating the emissions	104
	Wastewater handling	Review and strengthen the QC procedures, in order to eliminate errors	105

Sector	Category	Recommendation	Paragraph reference
		Provide supporting explanations for AD and emission trends, including significant inter-annual changes or fluctuations	106
	Waste incineration	Provide explanations of the methods, data sources and assumptions used to estimate emissions from waste incineration with energy recovery	107
		Provide a clear and adequate explanation, including a general description of the sewage sludge treatment stream across subcategories, of how relevant emission estimates are accounted for	108
	Other (waste)	Provide sufficient information and documentation for this category, including the sources of emissions	109
Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol	Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol	Provide information on how it is ensured that afforestation and reforestation occurring on deforestation land is distinguished from afforestation and reforestation taking place on other land	113
	Activities under Article 3, paragraph 3, of the Kyoto Protocol	Reflect the recommended revisions to the estimates of carbon stock changes in the biomass pool for land subject to afforestation and reforestation	115
	Deforestation – CO_2	Improve the tracking of deforested lands by including information on subsequent land-use changes and the management practices applied to them	117
	Forest management – CO_2	Provide transparent information regarding burning and forest management lands	121
	National registry	Promptly make all non-confidential information publically available in accordance with decision 13/CMP.1, annex, chapter II.E, paragraphs 44–48	124
	Calculation of the commitment period reserve	Include revised information on the commitment period reserve in the next annual submission	125
	Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol	Provide the additional information provided during the review of the 2012 annual submission in the NIR	130

IV. Questions of implementation

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

Annex I

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 the Czech Republic 2012. Available at <http://unfccc.int/resource/docs/2012/asr/cze.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2012. Available at <http://unfccc.int/resource/webdocs/sai/2012.pdf>.

FCCC/ARR/2011/CZE. Report of the individual review of the annual submission of the Czech Republic submitted in 2011. Available at <http://unfccc.int/resource/docs/2012/arr/cze.pdf>.

UNFCCC. *Standard independent assessment report*, parts I and II. 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 Mr. Ondrej Minovsky (Czech Hydrometeorological Institute), including additional material on the methodologies and assumptions used. The following documents[1] were also provided by the Czech Republic:

Czech Government, 2010, *THE DEVELOPMENT COOPERATION STRATEGY OF THE CZECH REPUBLIC 2010–2017*

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[1] Reproduced as received from the Party.

Annex II

Acronyms and abbreviations

AD	activity data
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
EF	emission factor
ERT	expert review team
EU	European Union
EU ETS	European Union emissions trading scheme
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
HFCs	hydrofluorocarbons
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
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)
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NH_3	ammonia
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joules)
QA/QC	quality assurance/quality control
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
TJ	terajoule (1 TJ = 10^{12} joules)
UNFCCC	United Nations Framework Convention on Climate Change