United Nations

FCCC/ARR/2014/CZE

Framework Convention on Climate Change

Distr.: General
13 April 2015

English only

Report on the individual review of the annual submission of the Czech Republic submitted in 2014*

* In the symbol for this document, 2014 refers to the year in which the inventory was submitted, and not to the year of publication.

GE.15-07734 (E)

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Contents

I. Introduction and summary

1. This report covers the review of the 2014 annual submission of the Czech Republic, coordinated by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1) (hereinafter referred to as the Article 8 review guidelines). The review took place from 22 to 27 September 2014 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Domenico Gaudioso (Italy); energy – Ms. Kristien Aernouts (Belgium), Ms. Diana Barba (Colombia) and Mr. Sangay Dorji (Bhutan); industrial processes and solvent and other product use – Mr. Menouer Boughedaoui (Algeria) and Mr. David Kuntze (Germany); agriculture – Mr. Daniel Bretscher (Switzerland) and Mr. Jacques Kouazounde (Benin); land use, land-use change and forestry (LULUCF) – Ms. Rehab Ahmed Hassan (Sudan), Ms. Thelma Krug (Brazil), Mr. Eiichiro Nakama (Japan) and Ms. Sekai Ngarize (United Kingdom of Great Britain and Northern Ireland); and waste – Ms. Anke Herold (European Union) and Ms. Violeta Hristova (Bulgaria). Mr. Boughedaoui and Mr. Gaudioso were the lead reviewers. The review was coordinated by Ms. Sevdalina Todorova (UNFCCC secretariat).

2. In accordance with the Article 8 review guidelines, a draft version of this report was sent to the Government of the Czech Republic, which provided comments that were considered and incorporated, as appropriate, into this final version of the report. All encouragements and recommendations in this report are for the next annual submission, unless otherwise specified. The expert review team (ERT) notes that the 2013 annual review report of the Czech Republic was published after 15 April 2014, which may have affected the Party's ability to implement recommendations and encouragements made in the previous review report.

3. All recommendations and encouragements included in this report are based on the ERT's assessment of the 2014 annual submission against the Article 8 review guidelines. The ERT has not taken into account the fact that Parties will prepare the submissions due by 15 April 2015 using the revised "Guidelines for the preparation of national communications by Parties include in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories" adopted through decision 24/CP.19. Therefore, when preparing the next annual submissions, Parties should evaluate the implementation of the recommendations and encouragements in this report, in the context of those guidelines.

4. In 2012, the main greenhouse gas (GHG) emitted by the Czech Republic was carbon dioxide (CO_2), accounting for 84.7 per cent of total GHG emissions[1] expressed in CO_2 equivalent (CO_2 eq), followed by methane (CH_4) (7.8 per cent) and nitrous oxide (N_2O) (5.9 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.7 per cent of the overall GHG emissions in the country. The energy sector accounted for 81.5 per cent of total GHG emissions, followed by the industrial processes sector (9.2 per cent), the agriculture sector (6.1 per cent), the waste sector (2.9 per cent) and the solvent and other product use sector (0.3 per cent). Total GHG emissions amounted to 131,466.03 Gg CO_2 eq and decreased by 33.0 per cent between the base year[2] and 2012. The ERT concluded that the description in the

[1] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of carbon dioxide equivalent 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 sources included in Annex A to the Kyoto Protocol only.

national inventory report (NIR) of the trends for the different gases and sectors is reasonable.

5. Tables 1 and 2 show GHG emissions from sources included in Annex A to the Kyoto Protocol (hereinafter referred to as Annex A sources), emissions and removals from the LULUCF sector under the Convention and emissions and removals from activities under Article 3, paragraph 3, and, if any, elected activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector and activity, respectively.

6. Information to be included in the compilation and accounting database can be found in annex I to this report.

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 2012

			Gg CO_2 eq								*Change (%)*
		Greenhouse gas	*Base year*	*1990*	*1995*	*2008*	*2009*	*2010*	*2011*	*2012*	*Base year–2012*
Annex A sources		CO_2	164 694.16	164 694.16	128 908.97	121 731.45	114 471.95	117 141.14	115 069.26	111 301.87	–32.4
		CH_4	17 888.89	17 888.89	13 408.47	10 517.45	10 202.32	10 370.40	10 330.30	10 255.77	–42.7
		N_2O	13 483.49	13 483.49	9 371.84	8 497.13	7 978.64	7 699.99	7 859.73	7 726.96	–42.7
		HFCs	0.21	NA, NE, NO	0.21	1 314.12	1 423.87	1 688.82	1 924.52	2 082.75	1 002 190.8
		PFCs	0.01	NA, NE, NO	0.01	28.23	33.13	36.66	9.07	6.57	93 745.4
		SF_6	82.65	79.17	82.65	95.19	105.45	71.45	83.67	92.11	11.4
KP-LULUCF	Article 3.3[b]	CO_2				–105.73	–118.15	–108.00	–186.85	–200.49	
		CH_4				NO	NO	NO	NO	NO	
		N_2O				0.33	0.35	0.35	0.37	0.36	
	Article 3.4[c]	CO_2	NA			–4 233.57	–6 247.58	–4 935.38	–6 690.60	–6 975.78	NA
		CH_4	NA			138.46	116.97	123.47	54.50	58.55	NA
		N_2O	NA			14.05	11.87	12.53	5.53	5.94	NA

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

[a] The 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 cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

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

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

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2012

			Gg CO_2 eq							*Change (%)*
		Sector	*Base year*	*1990*	*1995*	*2008*	*2009*	*2010*	*2011*	*2012*	*Base year–2012*
Annex A sources		Energy	156 747.78	156 747.78	124 728.23	115 348.58	110 333.69	112 584.04	110 424.15	107 090.06	–31.7
		Industrial processes	19 506.06	19 502.36	13 063.18	14 053.80	11 511.78	12 190.83	12 493.41	12 095.48	–38.0
		Solvent and other product use	764.83	764.83	596.31	515.27	506.15	492.05	469.42	455.57	–40.4
		Agriculture	16 307.19	16 307.19	10 363.99	8 704.55	8 264.36	8 058.81	8 162.75	8 058.37	–50.6
		Waste	2 823.55	2 823.55	3 020.45	3 561.38	3 599.39	3 682.72	3 726.82	3 766.54	33.4
		LULUCF	NA	–3 437.47	–6 939.89	–4 436.56	–6 528.03	–5 182.53	–7 011.84	–7 251.97	NA
		Total (with LULUCF)	**NA**	**192 708.23**	**144 832.26**	**137 747.01**	**127 687.33**	**131 825.93**	**128 264.71**	**124.214.06**	**NA**
		Total (without LULUCF)	**196 149.40**	**196 145.70**	**151 772.15**	**142 183.57**	**134 215.35**	**137 008.46**	**135 276.55**	**131 466.03**	**–33.0**
		Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
KP-LULUCF	Article 3.3[c]	Afforestation and reforestation				–261.56	–283.76	–309.68	–346.73	–369.94	
		Deforestation				156.17	165.95	202.04	160.24	169.81	
		Total (3.3)				**–105.40**	**–117.80**	**–107.64**	**–186.49**	**–200.13**	
	Article 3.4[d]	Forest management				–4 081.06	–6 118.73	–4 799.38	–6 630.57	–6 911.29	
		Cropland management	NA			NA	NA	NA	NA	NA	NA
		Grazing land management	NA			NA	NA	NA	NA	NA	NA
		Revegetation	NA			NA	NA	NA	NA	NA	NA
		Total (3.4)	**NA**			**–4 081.06**	**–6 118.73**	**–4 799.38**	**–6 630.57**	**–6 911.29**	**NA**

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable.

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

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

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

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

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

7. The 2014 annual submission was submitted on 15 April; it contains a complete set of common reporting format (CRF) tables for the period 1990–2012 and an NIR. The Czech Republic further submitted a revised NIR on 8 May 2014. The Czech Republic also submitted the information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry and the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 15 April 2014.

8. The Czech Republic submitted revised emission estimates and a revised NIR on 10 November 2014 in response to the list of potential problems and further questions raised by the ERT. The values used in this report are those submitted by the Czech Republic on 10 November 2014.

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

2. Questions of implementation raised in the 2013 annual review report

10. The ERT noted that no questions of implementation have been raised in the 2013 annual review report.

3. Overall assessment of the inventory

11. Table 3 contains the ERT's overall assessment of the annual submission of the Czech Republic. For recommendations for improvements for specific categories, please see the paragraphs cross-referenced in the table.

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

Issue	*Expert review team assessment*	*General findings and recommendations*
The ERT's findings on completeness		
Annex A sources[a]	Complete	Mandatory: none
		Non-mandatory: CO_2 emissions from post mining (underground mines) and surface mines; CO_2 from solid fuel transformation; CO_2 and N_2O from refining and storage of oil; CO_2 and CH_4 from distribution of oil products; CO_2 from asphalt roofing; CO_2 from road paving with asphalt; import and exports of HFCs, PFCs and SF_6 in products (potential emissions); CH_4 from direct soil emissions; and N_2O from

Issue	*Expert review team assessment*	*General findings and recommendations*
		industrial wastewater (wastewater and sludge) The ERT encourages the Party to estimate and report emissions from all non-mandatory categories
Land use, land-use change and forestry[a]	Complete	Mandatory: none
		Non-mandatory: CO_2, CH_4, and N_2O emissions from harvested products. The notation keys "NA" and "NO" were in use for some categories, such as mineral soils for wetlands and grassland converted to settlements, where the ERT considered that "NE" should have been reported (see para. 66 below) The ERT encourages the Party to estimate and report emissions from all non-mandatory categories
KP-LULUCF	Complete	
The ERT's findings on recalculations and time-series consistency		
Transparency of recalculations	Sufficiently transparent	Please see paragraphs 20, 33, 35, 48, 65 and 75 below for category-specific findings
Time-series consistency	Sufficiently consistent	Please see paragraphs 26, 32, 52, 56, 57, 67 and 90 below for category-specific findings
The ERT's findings on QA/QC procedures	Sufficient	The Czech Republic has elaborated a QA/QC plan and has implemented tier 1 QA/QC procedures in accordance with that plan. However, the ERT has noted some inconsistencies between the information provided in the CRF tables and the NIR and within the NIR. The ERT recommends that the Party enforce the sector-specific QA/QC procedures and report on the respective category-specific checks and results in the NIR Please see paragraphs 12, 13, 22, 33, 42, 45, 49, 58 and 76 below for general and category-specific recommendations
The ERT's findings on transparency	Sufficiently transparent	The ERT noted improvements in the transparency compared with the previous submission. The ERT notes, however, further room for improvement and recommends that the Czech Republic enhance the transparency of the NIR, by reporting more information in the sectoral chapters, including detailed information on the methods and emission factors used for the calculation of emission

Issue	*Expert review team assessment*	*General findings and recommendations*
		estimates, as well as a description of data sources and assumption used Please see paragraphs 24, 28, 29, 30, 36, 37, 40, 41, 44, 49, 52, 55, 57, 62, 72, 78, 79 and 83 below for category-specific recommendations

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, CRF = common reporting format, ERT = expert review team, IPCC = Intergovernmental Panel on Climate Change, KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NE = not estimated, NO = not occurring, QA/QC = quality assurance/quality control.

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

12. In response to recommendations made in previous review reports, the Czech Republic has improved and updated its quality assurance/quality control (QA/QC) plan and updated and supplemented its improvement plan. This plan concentrates on the introduction of higher-tier estimation methods. Lack of personnel and financial resources has delayed the implementation of the plan in recent years. Despite that, improvements have been introduced in the present annual submission and further improvements are expected in the 2015 annual submission. For further improvement of the inventory, the ERT recommends that the Czech Republic:

(a) Strengthen the capacity of the national system by solving the issues of budget restrictions and staff shortages;

(b) Improve the accuracy of the inventory further, from the 2015 annual submission, by moving to higher-tier estimation methods, prioritizing the introduction of these methods on the basis of the key category and uncertainty analyses.

13. The NIR contains general information on QA/QC for different categories in the LULUCF sector; however, no detailed information on the sector and category-specific QA/QC procedures has been provided. In response to questions raised by the ERT during the review, the Party indicated that in 2014, the Czech Republic started a bilateral QA process with Slovakia. The initial phase of this process is focusing on parts of sectors of the inventory other than LULUCF and the schedule for the LULUCF sector has not been agreed; however, it is intended that the QA/QC review process will span three to four years and will address key categories in both countries. The ERT recommends the Czech Republic continue its work on sector- and category-specific QA/QC procedures and provide information on the progress made in future annual submissions.

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

Inventory planning

14. The NIR described the national system for the preparation of the inventory. As indicated by the Party in response to questions raised by the ERT during the review, there were no changes to the inventory planning process. The description of the inventory

planning process, as contained in the report of the individual review of the annual submission of the Czech Republic submitted in 2013,[3] remains relevant.

Inventory preparation

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

Table 4
Assessment of inventory preparation by the Czech Republic

Issue	*ERT assessment*	*ERT findings and recommendations*
Key category analysis		
Was the key category analysis performed in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	Level and trend analysis performed, including and excluding LULUCF
Approach followed?	Both tier 1 and tier 2	The tier 2 key category analysis was introduced starting from the present submission. The ERT commends the Party for this improvement
Were additional key categories identified using a qualitative approach?	No	
Has the Party identified key categories for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol following the guidance on establishing the relationship between the activities under the Kyoto Protocol and the associated key categories in the UNFCCC inventory?	Yes	
Does the Party use the key category analysis to prioritize inventory improvements?	Yes	
Assessment of uncertainty analysis		
Approach followed?	Tier 1	
Was the uncertainty analysis carried out in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	The uncertainty analysis is carried out both with and without LULUCF, but in the 2014 annual submission only the analysis with LULUCF has been reported. The ERT recommends that the Party report the uncertainty analysis both

[3] FCCC/ARR/2013/CZE, paragraph 10.

Issue	*ERT assessment*	*ERT findings and recommendations*
		including and excluding the LULUCF sector For category-specific findings, please see paragraphs 21 and 50 below
Quantitative uncertainty (including LULUCF)	Level = 3.2% Trend = 2.2%	
Quantitative uncertainty (excluding LULUCF)	Not provided Not provided	

Abbreviations: ERT = expert review team, IPCC good practice guidance = the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, LULUCF = land use, land-use change and forestry.

Inventory management

16. There were no changes to the inventory management process carried out by the Party for the 2014 annual submission, as indicated by the Party in its NIR. The description of the inventory management process, as contained in the report of the individual review of the annual submission of the Czech Republic submitted in 2013,[4] remains relevant.

5. Follow-up to previous reviews

17. In the present annual submission, in response to recommendations made in previous review reports, the Czech Republic has implemented a number of improvements as noted throughout this report. The ERT welcomes these improvements as well as the transparent reporting of the improvements in chapter 10 of the NIR. However, the ERT encourages the Czech Republic to include all pending recommendations from previous review reports in the inventory development plan and systematically report on the progress of their implementation.

18. Recommendations from previous reviews that have not yet been implemented, as well as issues the ERT identified during the 2014 annual review, are discussed in the relevant sectoral chapters of the report and in table 9 below.

B. Energy

1. Sector overview

19. The energy sector is the main sector in the GHG inventory of the Czech Republic. In 2012, emissions from the energy sector amounted to 107,090.06 Gg CO_2 eq, or 81.5 per cent of total GHG emissions. Since 1990, emissions have decreased by 31.7 per cent. The key drivers for the fall in emissions in the sector are reductions in emissions in the categories of manufacturing industries and construction and other sectors (residential) due to economic restructuring and a shift in the fuel mix (to increased gaseous fuel and biomass use). Within the sector, 53.6 per cent of the emissions were from energy industries,

[4] FCCC/ARR/2013/CZE, paragraph 12.

followed by 15.8 per cent from transport, 15.5 per cent from manufacturing industries and construction and 10.2 per cent from other sectors. Fugitive emissions from solid fuels accounted for 3.3 per cent of emissions and oil and natural gas accounted for 0.5 per cent. The remaining 1.0 per cent was from other (energy sector).

20. The Czech Republic has made recalculations between the 2013 and 2014 annual submissions for this sector. The most significant recalculations made by the Czech Republic between the 2013 and 2014 annual submissions were in the category CO_2 emissions from manufacturing industries and construction. The recalculations are a result of the development of new country-specific CO_2 emission factors (EFs) for liquefied petroleum gas (LPG) and refinery gas and improvement in the activity data (AD) for gasoline and diesel oil as part of the implementation of the QA/QC plan. These recalculations were also made in response to recommendations that the Party move to higher-tier estimation methods made in previous review reports. Compared with the 2013 annual submission, the recalculations increased emissions in the energy sector by 909.56 Gg CO_2 eq (0.8 per cent) and increased total national emissions for 2011 by 0.7 per cent. The reasons for the recalculations were not always adequately explained. The NIR does not provide information about the impact of the recalculations in the categories and on the entire energy sector and does not provide a detailed explanation about the changes in fuel consumption in road transportation (liquid fuels), residential (solid fuels) and in manufacturing industries and construction and other sectors (gaseous fuels). Therefore, the ERT recommends that the Party improve the transparency of its reporting of the changes in the AD used and the impact for the recalculations made.

21. The previous review report recommended that the Party provide a full elaboration of the method of expert judgement that the Czech Republic used for reassessment of the uncertainty values, which was carried out in the 2013 annual submission, and how this judgement helped to improve the uncertainty analysis in the energy sector. However, in the 2014 inventory submission this information was not included in the NIR. The ERT therefore reiterates the recommendation made in the previous review report that the Party provide a full elaboration of the method of expert judgement used to improve the uncertainty values.

22. The ERT commends the Party for its progress in implementation of the improvement plan and the continuing efforts made in order to move to higher estimation methods for the EFs of some fuels (LPG and refinery gas), as well as the improvement of the transparency of reporting (e.g. the inclusion of a justification for the lower EF for liquid fuels in the subcategory manufacture of solid fuels: the inclusion of information on the estimation of emissions from charcoal combustion) and the improvement in the AD used for some categories (e.g. transportation), also following the recommendations of the previous review report. The ERT noted, however, that there are some pending recommendations from the previous review report (e.g. to ensure consistent reporting in CRF tables 1.A(b), 1.A(c) and 1.A(d) for the reference approach) and recommends that the Party continue the work done so far in implementing the recommendations of previous review reports, e.g. by further improving the QA/QC procedures.

2. Reference and sectoral approaches

23. Table 5 provides a review of the information reported under the reference approach and the sectoral approach, as well as comparisons with other sources of international data. Issues identified in table 5 are more fully elaborated in paragraphs 24–28 below.

Table 5
Review of reference and sectoral approaches

Issue	*Expert review team assessment*	*Paragraph cross-references*
Difference between the reference approach and the sectoral approach	Energy consumption: –23.34 PJ, –1.86% CO_2 emissions: –1 909.65 Gg CO_2, –1.89 %	
Are differences between the reference approach and the sectoral approach adequately explained in the NIR and the CRF tables?	No	See para. 24 below
Are differences with international statistics adequately explained?	No	See para. 25 below
Is reporting of bunker fuels in accordance with the UNFCCC reporting guidelines?	Yes	See para. 26 below
Is reporting of feedstocks and non-energy use of fuels in accordance with the UNFCCC reporting guidelines?	No	See paras. 27–28 below

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

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

24. Although the overall percentage difference between the reference approach and the sectoral approach was lower than 2 per cent for 2012, the ERT observed that the difference in CO_2 emissions for liquid fuels was –6.0 per cent and for gaseous fuels the difference was 4.1 per cent. The ERT also found differences of approximately 4 per cent between the CO_2 emissions from the reference and sectoral approaches for 1997 and 1998. The ERT did not find in the NIR detailed explanations on the reasons behind the differences. In response to a question raised by the ERT during the review, the Party explained that the differences result from statistical differences within the official energy balance reported by the Czech Statistical Office (CZSO) (e.g. for lignite the difference was 1.76 kt in 1997 and 1.45 kt in 1998, which is equivalent to 21 PJ in 1997 and 18 PJ in 1998). The ERT encourages the Czech Republic to improve the transparency of the comparison between the approaches provided in the NIR, including explanations of the differences, in its next annual submission.

25. The ERT noted that there are still inconsistencies between the CRF tables and the International Energy Agency (IEA) data for particular fuels (e.g. production figures for bituminous coal are 2 per cent lower in the CRF tables) and the overall trend in apparent fuel consumption (29 per cent decrease according the CRF tables and 27 per cent according to the IEA data). The ERT reiterates the recommendation made in the previous review report that the Czech Republic address the issue of alignment of the data reported to IEA and the data in the CRF tables, and adequately explain any remaining differences.

International bunker fuels

26. The Czech Republic reports on only jet kerosene for international aviation under bunker fuels. The ERT notes that the differences with the IEA data reported in the previous

annual submission are still present in the current submission for several years (e.g. for the years 1990–1992 the data in the CRF tables are 7–21 per cent lower than the IEA data). The ERT welcomes the information provided in the NIR on the distribution on jet kerosene consumption in the CRF tables and the comparison with the IEA data for 2012, and encourages the Party to include information for the entire time series and particularly for the years that show large differences in data.

Feedstocks and non-energy use of fuels

27. The ERT observed that in CRF table 1.A(d) there is no clear information about where parts of the feedstock use are allocated, mainly in the case of naphtha, coal oils and tars and the use of liquid fuels as lubricants. In response to a question raised by the ERT during the review, the Party explained that: 20 per cent of naphtha is reported under chemicals (manufacturing industries and construction); consumption and emissions from lubricants are reported under chemicals (manufacturing industries and consumption, energy sector) (used in cement furnaces); and coal oils and tars are reported under other categories in the energy sector (energy industries and manufacturing industries and construction). The ERT recommends that the Czech Republic include more detailed explanations of the distribution and use of the liquid fuels used as feedstocks in the energy sector in CRF table 1.A(d) and in the NIR.

28. As noted in the previous review report, there is inconsistency between the values of emissions from blast furnaces reported in CRF table 1.A(d) (5,482.70 Gg) and under iron and steel production in CRF table 2(I).A-G (5,250.45 Gg). In response to a question raised by the ERT during the review, the Czech Republic explained that the difference results from the different methodologies used in the two tables. The ERT considers that the information provided by the Party was sufficient to understand the differences observed and agrees that the approach is consistent with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), but encourages the Party to include further explanations in the NIR in order to improve the transparency of its reporting.

3. Key categories

Stationary combustion: solid fuels – CO_2

29. The ERT identified that the CO_2 implied emission factor (IEF) for the use of solid fuels in manufacture of solid fuels and other energy industries (74.23 t/TJ) is low compared with other countries in the region that have similar levels of underground coal production, such as Germany (with an CO_2 IEF of 129.27 t/TJ) and Slovakia (192.51 t/TJ). In response to questions raised by the ERT during the review, the Party explained that, in the subcategory manufacture of solid fuels and other energy industries, emissions from the gasification of brown coal were included. In this gasification process, 'energo-gas', with a low EF, is burned in power stations and therefore the EF of solid fuels in the Czech Republic is lower than the EFs observed in other countries that do not have this process. The ERT recommends that the Czech Republic include further information about the country-specific EF in the NIR.

Road transportation: liquid fuels – N_2O

30. The ERT noted that the N_2O IEFs for gasoline (19.27 kg/TJ) and diesel oil (4.94 kg/TJ) have increased by 169.7 and 101.9 per cent, respectively, between 1990 and 2012, reaching values that are the highest reported by all Parties for the 2004–2012 period (ranges: 0.34–19.26 kg/TJ for gasoline and 0.24–4.94 kg/TJ for diesel oil). In response to questions raised by the ERT during the review, the Party explained that changes in the AD due to the changes in distribution in the fleet caused the change in the N_2O emissions. The ERT encourages the Party to include the detailed information provided during the review

week in the relevant chapter of the NIR. The ERT further recommends that the Party include in the NIR more detailed information about different vehicle technologies and their shares in the road transportation sector in order to improve the transparency of reporting.

Other transportation: gaseous fuels – CO_2

31. The ERT identified a difference between the CO_2 IEF for the consumption of gaseous fuels in road transportation (55.49 t/TJ) and in pipeline transport (55.15 t/TJ). In response to a question raised by the ERT during the review, the Party explained that this difference is a result of country-specific EFs and that for CO_2 emissions in road transportation an oxidation factor equal to 1 is used rather than 0.995, which is used in the other subcategories. The ERT accepted the explanation, but recommends that the Czech Republic include detailed information to explain and justify the difference in the CO_2 IEF of the same fuel used in different subcategories and the oxidation factors applied.

Coal mining and handling: solid fuels – CH_4

32. The previous review report indicated that the Czech Republic has used higher-tier methods to estimate the emissions from solid fuels (underground mines), but has not applied the improved EF to the entire time series, which results in a decrease of the CH_4 IEF from 13.22 kg/t in 1990 to 10.39 kg/t in the period 2008–2012 and inter-annual changes reaching 21.0 per cent between 1999 and 2000. The ERT noted that there is no change in the time series as recommended in the previous review report and therefore reiterates the recommendation made in the previous review report that the Party ensure time-series consistency for historical data.

4. Non-key categories

Stationary combustion: liquid fuels – N_2O

33. The Czech Republic states in its NIR that it has used an N_2O EF of 0.6 kg/TJ for liquid fuels uniformly for all stationary combustion. However, the ERT identified recalculations between the time series of N_2O emissions and the N_2O IEF from liquid fuels in petroleum refining for the period 1995–2012 ranging from 0.25 to 1.48 kg/TJ. In addition, neither a change in AD for this category nor any other recalculations were reported, which indicated there could be a reporting problem. Therefore, the ERT included these issues in the list of potential problems and further questions raised by the ERT. Responding to the list of potential problems and further questions raised by the ERT, the Czech Republic explained the issue with a typographical error, provided revised emission estimates for this category and submitted revised CRF tables for the entire time series. The revised estimates affected the period 1995–2012 and increased the emissions in the period 2008–2012 by 18.97 Gg CO_2 eq. The ERT recommends that the Czech Republic improve the QA/QC procedures in order to avoid similar errors in the future.

C. Industrial processes and solvent and other product use

1. Sector overview

34. In 2012, emissions from the industrial processes sector amounted to 12,095.48 Gg CO_2 eq, or 9.2 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 455.57 Gg CO_2 eq, or 0.3 per cent of total GHG emissions. Since the base year, emissions have decreased by 38.0 per cent in the industrial processes sector, and decreased by 40.4 per cent in the solvent and other product use sector. The key drivers for the fall in emissions in the industrial processes sector were the transition to a market economy in the early 1990s, the cessation of heavy industry activities in the country and investment in environmental protection in the industrial processes sector. Within the

industrial processes sector, 43.9 per cent of the emissions were from metal production, followed by 28.9 per cent from mineral products, 18.0 per cent from consumption of halocarbons and SF_6 and 9.3 per cent from the chemical industry. Emissions from other production and other (industrial processes) were reported as "NA" and emissions from production of halocarbons and SF_6 were reported as "NA, NO".

35. The Czech Republic has made recalculations between the 2013 and 2014 annual submissions for the industrial processes sector. The most significant recalculation made by the Czech Republic between the 2013 and 2014 annual submissions was in the following category: CO_2 emissions from iron and steel production. The recalculation was made to adapt to revised methodologies (e.g. implement tier 2 methodology for the entire time series of iron and steel production) and to respond to recommendations made in the previous review report. Compared with the 2013 annual submission, the recalculations decreased emissions in the industrial processes sector by 76.71 Gg CO_2 eq (0.6 per cent) and decreased total national emissions for 2011 by 0.1 per cent. The recalculations were adequately explained.

36. The ERT noted the Party's improvements in the transparency of reporting for the sector, including the provision of additional information on iron and steel production (details on the flows of blast furnace gas between pig-iron production and steel production) and on the consumption of fluorinated gases (F-gases) (adding the AD and the methods for the annual stocks) as recommended in the previous review report. However, the ERT noted some further room for improvement in transparency, as specified below (see paras. 37, 40, 41 and 44).

2. Key categories

Nitric acid production – N_2O

37. The Czech Republic does not specify whether the AD and EFs for this key category are plant-specific. In response to a question raised by the ERT during the review regarding AD and EF sources, the Party clarified that the methodology is based on several national studies conducted over recent years, as specified in the NIR, and the data for production, destruction and emissions are available to the inventory team from the three facilities producing nitric acid in the country. The data are collected every year and the updated reports are provided by the expert for the chemical industry. The Party indicated that this information will be included in the relevant chapter of the NIR in the next annual submission. The Party further informed the ERT that starting from 2013 (2015 annual submission) more detailed data will be available for the category as a result of its reporting under the European Union Emissions Trading System (based on Regulation EU No. 601/2012). The ERT welcomes this information and recommends that the Party include it, as provided to the ERT during the review, in the NIR, as well as any further relevant information following the change in data sources.

Iron and steel production – CO_2

38. The previous review report recommended that the Czech Republic transparently document the evolution of the IEFs in the NIR and explain the development of the ratios of production technologies; namely, the ratio of electric arc furnaces, of traditional iron works, of recycling of scrap iron and of electric arc-based melting technologies.[5] The ERT notes that the recommendation was not followed in the current NIR and reiterates the recommendation of the previous review report that the Czech Republic include such

[5] FCCC/ARR/2013/CZE, paragraph 53.

information on the changes in iron and steel processes in the NIR to increase the transparency of its reporting.

Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6[6]

39. The Czech Republic reports several species of HFCs and PFCs under domestic refrigeration and mobile air conditioning in CRF table 2(II). In the category refrigeration and air-conditioning equipment no emissions are reported under commercial, industrial and transport refrigeration and stationary air conditioning. In the NIR, the Party explains that emissions from these subcategories are included in the two reported categories because of a lack of detailed information. During the review, the ERT requested further information on the allocation of emissions, as well as on the calculation model and data sources. In response to the questions raised by the ERT during the review, the Czech Republic informed the ERT that AD are obtained through mandatory F-gas regulation reporting (EC 842/2006) by single users and importers. These users are later contacted by sending them a simple questionnaire on the use and fate of their reported F-gases. By this arrangement a simple database, including information on type, quantity and use of F-gases, is created and updated for the purposes of the inventory. The use, however, is only available in terms on first filling and servicing and distinguishes only stationary and mobile appliances. Therefore, aggregated parameters are used for emission estimation. The model for estimating emissions is based on a two-phase run estimate for every gas type. Aggregated mean lifetimes are considered to be half for serviced equipment. Lifetimes are represented as normally distributed around the mean value. The model uses equations for tier 2 estimates from 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), with parameters slightly modified to account for the level of aggregation used.

40. In response to a question raised by the ERT during the review, the Czech Republic informed the ERT that in the 2014 annual submission, in addition to the model mentioned above, some preliminary data were used from a study in progress, which implements the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) and which is planned to be implemented in the next annual submission. The ERT commends the Czech Republic for developing a new model that differentiates the subcategories and recommends that the Czech Republic consistently implement the new methods, data sources and EFs and transparently document the underlying information in the NIR. In particular, the information in the NIR should specify from which subcategories (domestic, commercial, industrial and transport refrigeration, mobile and stationary air conditioning) the emissions come and provide documentation on the AD sources, lifetimes and EFs used.

41. The Czech Republic reports disposal emissions for domestic refrigeration from 1996 onwards and for mobile air conditioning from 1998 for HFC-134a. In response to a question raised by the ERT during the review regarding the estimation of emissions from disposal, the Party explained that during disposal the F-gases removed at decommissioning are stored for future destruction and recycling. This information is from an annually updated study on usage of F-gases in the Czech Republic, which is based on direct contact with companies dealing with imports, exports, use and destruction of F-gases. These companies claim to still have large amounts of old refrigerants (freons) in storage. The ERT recommends that the Czech Republic transparently describe in the NIR how the

[6] PFCs and SF_6 emissions from this category are not key. However, since all issues relating to this category are discussed as a whole, the individual gases are not assessed in separate sections.

percentages of the F-gases captured and the percentage of the F-gases emitted are identified and further explain the storage of the large amounts of the F-gases practiced in the country.

42. CRF table 2(II).F reports AD and emissions of HFCs from stocks in foam blowing. However, in the NIR, the Czech Republic reports that use of HFCs for foam blowing was not reported in 2012 because HFCs are being replaced by other hydrocarbons. Therefore, the ERT did not find methodological information in the NIR to indicate how emissions from stocks were estimated. In response to a question raised by the ERT during the review, the Czech Republic clarified the methodology and assumptions used in the estimates. The ERT recommends that the Party strengthen the QA/QC procedure before submitting the NIR and include the relevant methodological information for the HFC estimates in the NIR.

43. The Czech Republic reports small amounts of emissions from HFCs, PFCs and SF_6 from semiconductor production (0.09975 t of hexafluoroethane (C_2F_6) for 2012). The ERT noted that the NIR contains no information on the number of plants and no production information, and does not provide an explanation of the reported emission trend (the emissions declined in recent years and even stopped for the gases SF_6, HFC-23 and tetrafluoromethane (CF_4): HFC-23 was reported for the years 1999 and 2007; CF_4 for the years 1997–2002 and 2006–2009; and SF_6 for the years 1999–2009). In response to a question raised by the ERT during the review, the Czech Republic stated that the number of plants is currently uncertain and the AD are based on mandatory reports of imports and exports by F-gas users. The ERT recommends that the Czech Republic identify the number of producers, add a description of the F-gas emission trend (reasons for the gaps in and cessation of the use of F-gases) and provide details on the method and EFs used in the next annual submission.

44. For 2012, the Czech Republic reports only emissions of SF_6 from stocks for soundproof windows (0.15 t SF_6); emissions from manufacturing and disposal are reported as "NO". In response to a question raised by the ERT during the review on the possible filling of windows with SF_6 in the country and on the assumed lifetime, the Czech Republic explained that filling of windows with SF_6 has not been reported in the country for several years because argon-based insulation has become the preferred technology. The Party further clarified that a lifetime of 25 years is assumed. The ERT recommends that the Czech Republic include this information in the next NIR in order to improve transparency of reporting.

45. Under the category other (consumption of halocarbons and SF_6) the Czech Republic currently reports only SF_6 emissions from soundproof windows. The ERT noted that according to the IPCC good practice guidance (page 3.63), there are other sources of emissions for this category, including: gas-air tracers used in research and for leak detectors; medical applications; equipment used in accelerators, lasers and night vision goggles; sport shoes; applications utilizing the adiabatic property of SF_6 (e.g. tennis balls); and military applications. The IPCC good practice guidance provides a decision tree for identifying sources (fig. 3.8) and calculation methods for SF_6 emissions in this category (equations 3.22 to 3.26). In response to a question raised by the ERT during the review on possible military, scientific or other uses of SF_6, the Czech Republic explained that occasional (experimental) usage is reported in this category. However, as this is not a key category, the category has not been subject to a QA process. During the review week, the ERT could not conclude whether or not there was a potential problem with the category. The ERT recommends that the Czech Republic investigate other uses of SF_6, and if they occur, estimate and report the emissions to ensure completeness of the estimates from the category.

3. Non-key categories

Aluminium production – PFCs

46. The Czech Republic reports emissions of nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOCs), sulphur oxides (SO_X) and carbon monoxide (CO) from primary aluminium production, but CO_2, CH_4 and PFC emissions are reported as not occurring ("NO"). In response to a question on this issue raised by the ERT during the review, the Czech Republic stated that there is only secondary aluminium production in the country and in order to avoid the use of F-gases, a 'cover salts' method is applied. The ERT recommends that the Czech Republic include this information in the next NIR together with an explanation of the cover salts (fluxes) method.

D. Agriculture

1. Sector overview

47. In 2012, emissions from the agriculture sector amounted to 8,058.37 Gg CO_2 eq, or 6.1 per cent of total GHG emissions. Since 1990, emissions have decreased by 50.6 per cent. The key drivers for the fall in emissions were decreases in the livestock population and the amount of synthetic fertilizer applied to soil. Within the sector, 60.8 per cent of the emissions were from agricultural soils, followed by 25.2 per cent from enteric fermentation and 14.0 per cent from manure management. Rice cultivation, prescribed burning of savannahs and field burning of agricultural residues were reported as "NO". Emissions from other (agriculture) were reported as "NA".

48. The Czech Republic has made recalculations between the 2013 and 2014 annual submissions for this sector. The most significant recalculation made by the Czech Republic between the 2013 and 2014 annual submissions was in the category manure management – CH_4 emissions from cattle. The recalculation was made in response to reiterated recommendations in previous annual review reports (see para. 53 below) and had repercussions on the categories enteric fermentation – CH_4, manure management – N_2O, and agricultural soils – N_2O. Compared with the 2013 annual submission, the recalculations increased emissions in the agriculture sector by 97.90 Gg CO_2 eq (1.2 per cent) and increased total national emissions for 2011 by 0.1 per cent. In general, the recalculations were not adequately explained, being scattered across the agriculture chapter and encompassing recalculations made for several submissions. The ERT recommends that the Czech Republic reallocate all information concerning recalculations, report it only once in the category-specific subchapters of the NIR and clearly distinguish the recalculations of the current annual submission from recalculations made for previous annual submissions.

49. The ERT considers that there is a general lack of transparency in reporting for the sector, in particular regarding the allocation of information to the category-specific subchapters (e.g. QA/QC, recalculations, time-series consistency) and the reporting of livestock data on a subcategory level. Furthermore, the ERT noted that several recommendations from previous review reports have not been addressed. Accordingly, the ERT recommends that the Czech Republic improve the transparency of the NIR (see para. 57 below), enforce the sector-specific QA/QC analysis and report on category-specific checks and results in the category-specific subchapters of the NIR. The ERT encourages the Party to include all pending recommendations from previous review reports in the inventory development plan and systematically report on their progress.

50. The ERT found that uncertainty estimates based on expert judgement are provided in the NIR but are not further described or referenced in the category-specific subchapters. In the case of direct and indirect emissions from agricultural soils, the ERT considers that the reported uncertainty estimates of 50 per cent are very low, considering uncertainty

ranges of the N_2O EFs in the Revised 1996 IPCC Guidelines (i.e. 0.0025–0.0225 for direct soil emissions (EF_1), 0.005–0.03 for pasture, range and paddock, 0.002–0.02 for deposited nitrogen (EF_4) and 0.002–0.12 for leaching and run-off (EF_5)). The ERT encourages the Czech Republic to review these uncertainty assessments and eventually revise the estimates. Furthermore, the ERT encourages the Party to provide more background information on uncertainties in the category-specific subchapters of the NIR.

51. The ERT noted that, apart from the analysis of uncertainties, no further planned improvements for the agriculture sector are mentioned in the NIR. In response to questions raised by the ERT during the review, the Czech Republic mentioned several areas where future improvements are considered: revision of the nitrogen excretion rate of goats, separate reporting of sewage sludge applied to agricultural soils, harmonization of reporting of ammonia emissions to different international bodies, and improved estimates of N_2O emissions from leaching and run-off. The ERT welcomes these planned improvements and encourages the Czech Republic to describe all planned improvements in the category-specific subchapters of the NIR, if possible with planned schedules for their implementation.

2. Key categories

Enteric fermentation – CH_4

52. The Czech Republic reported in its NIR that the age limits of "calves" and "young bulls and heifers" changed from 6 months to 8 months between 2009 and 2010 and provided data on their body weights. In response to a question raised by the ERT during the review, the Czech Republic stated that there is an error in the text of the NIR and in the values reported in NIR table 6-4. The values for body weights of bulls 8–12 months (formerly bulls 6–12 months) and calves for the last period after 2010 should be 350 kg and 150 kg per head, respectively. Furthermore, the Czech Republic emphasized that the shift in the age limit has correctly been accounted for by considering the respective change in body weight when calculating the EFs and that therefore the total reported emissions are correct. The ERT recommends that the Czech Republic correct the erroneous reporting in the NIR and transparently describe how time-series consistency is assured in the relevant subchapter of the NIR.

Manure management – CH_4

53. The Czech Republic used a tier 2 method for reporting CH_4 emissions from manure management for dairy and non-dairy cattle for the first time during the 2014 annual submission. The ERT commends the Czech Republic for the improvement and the increase in the accuracy of its reporting.

54. During the review, variations in the trend for the CH_4 IEFs for manure management of non-dairy cattle were identified that showed gradual increases and values over 10 kg/head/year between 2007 and 2010. The 2010 value (8.61 kg/head/year) was 15.0 per cent below the 2009 value (10.14 kg/head/year) and the 2011 and 2012 values were at a similarly low level (both at 8.65 kg/head/year). In response to a question raised by the ERT during the review, the Czech Republic explained that the decrease in the trend of IEFs is mainly the result of an abrupt increase in the fraction of pasture used for suckler cows (as a subcategory of non-dairy cattle) between 2009 and 2010. During the review, based on information provided by the Party, the ERT confirmed that the distribution of animal waste management systems for non-dairy cattle is not stable over the inventory time series. Furthermore, the ERT concluded that reporting in the NIR (i.e. table 6-5 and table 6-6), in CRF table 4.B(a) and in CRF table 4.B(b) is not consistent and not transparent. Values in CRF table 4.B(b) for non-dairy cattle suggest an increase of the share of pasture, range and paddock manure from 19.5 per cent in 2009 to 25.2 per cent in 2010. This finding is

confirmed by information in the NIR. At the same time, the share of pasture, range and paddock manure for non-dairy cattle in CRF table 4.B(a) remains constant at 20 per cent.

55. Given the circumstances mentioned above, the ERT considered that there is a lack of transparency in the reporting of CH_4 emissions from manure management of non-dairy cattle. It could not be excluded that there was an underestimation of emissions. Therefore, this issue was included in the list of potential problems and further questions raised by the ERT.

56. In response to the list of potential problems and further questions raised by the ERT, the Czech Republic submitted revised estimates and additional background information. The abrupt increase of grazing time for suckler cows between 2009 and 2010 was redistributed to the time period 2007–2011 to better reflect the smooth transition in actual livestock management. Accordingly, the trend of CH_4 IEFs for manure management of non-dairy cattle no longer displays a conspicuous drop between 2009 and 2010. The revision was conducted for the years 2007–2011, leaving all other years unchanged. According to the changes in grazing time of suckler cows for these years, all emission estimates in all agricultural categories (i.e. enteric fermentation, manure management and agricultural soils) have been changed. The impact of the revised estimates on overall emissions for the agriculture sector was –0.97, –2.05, +8.87, +0.42 and +0.26 Gg CO_2 eq for the years 2007, 2008, 2009, 2010 and 2011, respectively. The ERT agrees with the recalculations and considers the problem resolved.

57. In order to improve transparency and consistency of reporting within the category, the ERT recommends that the Czech Republic:

(a) Consistently report the distribution of animal waste management systems across all emission categories in the NIR as well as in CRF tables 4.B(a) and 4.B(b);

(b) Provide the data used to estimate the weighted EF for non-dairy cattle on an animal subcategory level in the NIR, including livestock population statistics, body weight, excretion of volatile solids (VS), methane-producing potentials (B_0) and animal waste management system allocation;

(c) Provide in the NIR all background information on the development of agricultural policies and structures that support the trends in animal waste management system allocation;

(d) Ensure time-series consistency of the estimates.

58. The Czech Republic has reported in its NIR data on weight, B_0 and VS for dairy and non-dairy cattle. However, the ERT noted that only body weight of dairy cattle is provided in the CRF tables (table 4.A); data on non-dairy cattle weight and B_0 and VS for both dairy and non-dairy cattle are not provided in the CRF tables. The ERT recommends that the Czech Republic include these data for dairy and non-dairy cattle in CRF tables 4.A and 4.B(a) in its next annual submission.

59. The Czech Republic applies the IPCC default value for Western Europe for CH_4 emissions from manure management for swine (3 kg/head/year). The ERT considers that this is in line with IPCC good practice guidance. However, the respective EF is largely determined by animal waste management system allocation, which may vary according to country-specific agricultural structures. Accordingly, the ERT encourages the Czech Republic to conduct relevant QA/QC checks and, if possible, to gather country-specific data on animal waste management system allocation for swine.

Manure management – N_2O

60. The Czech Republic uses a nitrogen (N) excretion rate of 25 kg/head/year for goats in accordance with table 4-20 of the Revised 1996 IPCC Guidelines. The ERT considers

that given the relatively low body weight of goats, such a high N excretion rate is improbable for this animal category. During the review, in response to a question raised by the ERT, the Czech Republic stated that it is aware of this fact but that, due to its low priority, a revision has not yet been conducted. The ERT encourages the Czech Republic to review, and as appropriate revise, the estimated N excretion rate for goats in future annual submissions and to include this issue under planned improvements.

Direct soil emissions – N_2O

61. The previous review report[7] found that it was not clear in the NIR which AD were used to estimate N_2O emissions from N-fixation and crop residues. During the current review the ERT did not identify substantial improvements in the NIR on this issue. In response to a question raised by the ERT during the review, the Czech Republic provided additional information regarding parameters related to crop residues and N-fixation (crop yields, $Frac_{DM}$, $Frac_{NCRO}$, $Frac_{NCRBF}$, Res/Crop). The ERT reiterates the recommendation made in the previous review report that the Czech Republic enhance the explanations for this category, among other ways by including the information provided to the ERT during the current review.

62. The Czech Republic does not report N_2O emissions from the application of sewage sludge under this category. In response to a question raised by the ERT during the review, the Czech Republic explained that all N_2O emissions from sewage sludge are accounted for under wastewater handling in the waste sector. Furthermore, the Czech Republic confirmed that sewage sludge is applied to agricultural land but stated that the quality of the available data is not yet sufficient to separately report the respective share. The ERT recommends that the Czech Republic increase the transparency of its reporting of N_2O emissions from sewage sludge in the NIR by clearly stating where the emissions are reported and for what reason. In addition, the ERT recommends that the Czech Republic consider reporting separately N_2O emissions from sewage sludge used as fertilizer in agriculture under the category agricultural soils.

Indirect emissions – N_2O

63. Previous review reports recommended that the Czech Republic improve its reporting of indirect emissions[8] and harmonize the reporting of ammonia emissions to different international bodies (i.e. the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution). In response to a question raised by the ERT during the review, the Czech Republic provided additional information regarding the estimation of indirect emissions from soils and mentioned that cooperation with the Research Institute of Agricultural Engineering that provides and reports information on ammonia emissions has started. Furthermore the Czech Republic analyses the possibility of improving the emission estimations of N_2O emissions from leaching and run-off. The ERT welcomes these planned improvements and reiterates the recommendation made in previous review reports that the Party improve its reporting of indirect emissions from soils.

E. Land use, land-use change and forestry

1. Sector overview

64. In 2012, net removals from the LULUCF sector amounted to 7,251.97 Gg CO_2 eq. Since 1990, net removals have increased by 111.0 per cent. The key drivers for the rise in

[7] FCCC/ARR/2013/CZE, paragraph 67(a).
[8] FCCC/ARR/2013/CZE, paragraph 67(b).

removals are the increase in living biomass in forests and a decrease in emissions from cropland. Within the sector, 7,255.03 Gg CO_2 eq of net removals were from forest land, followed by 301.68 Gg CO_2 eq from grassland. Net emissions were reported from cropland (180.92 Gg CO_2 eq), settlements (99.26 Gg CO_2 eq) and wetlands (24.55 Gg CO_2 eq). The remaining 0.01 Gg CO_2 eq were from other (lime application on forest land). Emissions from other land were reported as "NA, NO".

65. The Czech Republic has made recalculations between the 2013 and 2014 annual submissions for this sector. The two most significant recalculations made by the Czech Republic between the 2013 and 2014 annual submissions were in the following categories: forest and cropland. The recalculations were made in response to the 2013 annual review report and following changes in AD for land areas and EFs for cropland. The Czech Republic changed the EF for the carbon fraction in woody biomass from 0.5 t C/t biomass from the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) to a more conservative 0.49 and 0.48 for the coniferous and broadleaf, respectively, for forest land converted to cropland and for land converted to forest land from the 2006 IPCC Guidelines. For forest land the recalculations were applied in order to rectify errors identified in the AD of land-use areas for the entire reporting period (1990–2012) and data on biomass residues associated with harvested wood. Compared with the 2013 annual submission, the recalculations decreased removals by 12.0 per cent and increased emissions by 1.2 per cent in the LULUCF sector. This translates to 947.38 Gg CO_2 eq for forest land and 1.8 Gg CO_2 eq for cropland. The recalculations were adequately explained. The ERT welcomes these improvements.

66. Reporting of the LULUCF sector is complete for the mandatory categories. However, the ERT notes that the Czech Republic continues to report in CRF tables 5.A, 5.B and 5.C areas of wetlands converted to forest land, cropland and grassland, while the area of organic soils is reported as "NO". As organic soils are common in wetlands it would be expected that land-use conversions from wetland organic soils would be reported. The previous review report recommended that the Party investigate the existence of organic soils and whether these are subject to the above-mentioned land-use changes, or provide transparent information that no organic soils occur under the land converted from wetlands to the other land-use categories. In response to questions raised by the ERT during the review, the Party indicated that in the context of its national circumstances the IPCC category of wetlands does not correspond to the general definition of wetland, which is commonly associated with wetland types such as swamps, marshes and bogs and such wetland types are commonly associated with forest land and therefore are reported in that category. The Party also highlighted that it plans to further investigate this issue as part of the improvement plan in the new cycle of the landscape inventory under the Czech Office for Surveying, Mapping and Cadastre. The ERT encourages the Party to investigate the existence of organic soils and whether these are subject to the above-mentioned land-use changes.

67. Following recommendations made in the previous review report, the Party improved the transparency of its reporting with regard to the land-use representation by providing transparent land-use matrices and updated information on land-use conversions in its 2014 NIR, clarifying the origin of the observed residual discrepancies in land-use areas and land-use transitions. The ERT commends the Party for its efforts in improving transparency and time-series consistency.

68. The ERT notes that there is a significant inter-annual variability in the amount of wood harvested, and the increase in net removals between 1990 and 2012 does not represent the general trend; for example, the harvest in 1990 was the second highest in the period, resulting in higher emissions than expected (see Fig. 7-7, "The applicable total

annual harvest drain for coniferous (Con.) and broadleaved (Broadl.) tree species, which includes both the reported quantities of merchantable wood for the two categories (Con. merch, Broadl. merch.) and the associated harvest loss (Con. extra, Broadl. extra) for the entire reporting period 1990 to 2012" and figure 7-10, "Current and previously reported assessment of emissions for category 5A Forest Land" in the NIR). During the review, the ERT requested an explanation for the observed fluctuations in the general trend, recognizing that the Party experienced disturbances and that harvest volumes fluctuated significantly over the entire time series. In response to questions raised by the ERT during the review, the Party provided raw data for harvest volumes for the years 1999–2013, including the share (as a percentage by species type) of accidental logging. The Party also indicated that the increment in the biomass carbon pool is dominated by the age class and species structure of Czech forests, while loss is determined by the actual annual harvesting volumes. The ERT welcomes the clarification by the Party and encourages the Party to include provided table in future annual submissions to ensure transparency.

69. The ERT notes that the Party has made an effort to improve the accuracy of its estimates of the carbon stock changes in mineral soils, as recommended in previous review reports, by subdividing the cropland areas within cadastral units by the tillage and input regimes. In its methodology the Party used a single set of default stock change factors (FLU = 1, FMG = 1.08 and FI = 1) from the 2006 IPCC Guidelines to obtain spatially averaged values for the carbon stock of mineral soils for annual and woody crops. During the review, in response to the questions raised by the ERT, the Party indicated that work to compile country-specific soil reference carbon stocks based on spatially explicit vector maps and country-specific empirical data is ongoing and that it is planning to reassess the stock change factors. The ERT recommends therefore that, in addition to subdividing cropland areas, the Party develop country-specific reference carbon stocks values/change factors associated with the tillage and input regimes.

2. Key categories

Forest land remaining forest land – CO_2

70. The Czech Republic states in its NIR that it uses the annual amount of total harvest reported by CZSO to estimate biomass losses, and also states that it assumes an additional 5 per cent loss and 15 per cent loss for accidental logging and salvage logging, respectively. It also assumes that 15 per cent of the residues are burned. The previous review report recommended that the Party provide transparent information to support the assumed values of accidental and salvage logging or, alternatively, use the actual information on areas subject to natural disturbance together with the biomass stocks to estimate the total biomass losses due to natural disturbances. In response to questions raised by the ERT during the review, the Party indicated that natural disturbances are not spatially explicit and the major cause of severe disturbance in the Czech Republic was the chronic decline of the most represented tree species, Norway Spruce, as a result of the combined effects of natural temperature change and long-term air pollution (acidification and nutrient degradation) in forest soils. The impact of this decline has resulted in a rise in the frequency of fatal fungal infestation (*Armillaria ostoyae*) and also bark beetle attack. The Czech Republic further stated that forest management rules require removal of such infested trees under the operation "accidental/unplanned sanitary felling" and this operation is registered and reported in addition to the normal planned felling volumes, as prescribed by the national forest management plan. In addition, the share of accidental logging on total harvested wood volume is also reported and accounted for in the inventory. The Czech Republic also indicated that it plans to improve the transparency of reporting of biomass losses due to natural disturbances in the next NIR by including the annual share of accidental logging since 1990 in a table or graph. The ERT encourages the Party to include transparent

information on the annual share of natural disturbances, including accidental logging, since 1990.

71. The Czech Republic has applied the tier 1 approach from the IPCC good practice guidance for LULUCF assuming that carbon stocks in dead organic matter (DOM) are constant over time (i.e. carbon stock change is reported as "NO"). In line with the previous review report, the ERT noted that, as forest land remaining forest land is a key category, it is not good practice to apply this assumption. The ERT considers that there could be significant stock changes in the carbon pool of DOM owing to the fact that harvest volumes have fluctuated significantly over the entire time series. During the review, the ERT asked the Party to provide information on progress made in order to apply a higher-tier method for estimating carbon stock changes in the DOM carbon pool. In response to the question raised by the ERT, the Party indicated that the repeated statistical inventory cycle of the Czech Republic national forest inventory (NFI) will be finalized by the end of 2014 or early 2015 and the Party plans to include an explicit estimation of DOM carbon pools. The Party also stated that it has commissioned a project including a repeated assessment of the landscape inventory CzechTerra, which will provide additional information on DOM by the end of 2015. Therefore, the ERT reiterates the recommendation made in the previous review report that the Czech Republic use the results of the next NFI, when they are available, to estimate the carbon stock changes in the DOM pool.

3. Non-key categories

Land converted to forest land – CO_2

72. The Party considered biomass losses for land converted to forest land to be insignificant, as it assumes that there has been no harvesting on such land and the first thinning losses take place in older age classes of forest. In response to a question raised by the ERT during the review, the Party indicated that natural disturbances are assumed to affect only older forests stands in the country, as no disturbance has been reported for forests stands up to 20 years old and only the older forests are susceptible to disturbances, including wind. Such an assumption could potentially lead to the underestimation of emissions from natural disturbances for land converted to forest land. Therefore, the ERT reiterates the recommendation made in the previous review report that the Party 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.

73. The ERT noted that the Party continues to estimate the above-ground biomass increment for land converted to forest land using area weights for the main tree species for forest land remaining forest land. The Party provided an explanation in the 2014 NIR) highlighting that the specific species composition of the newly converted land is unknown. The ERT believes that this could potentially lead to underestimation or overestimation of the mean biomass increment for land converted to forest land, depending on species composition, because increment values differ significantly. In response to a question raised by the ERT during the review, the Party indicated that it plans to revise the mean biomass increment for land converted to forest land once the information from the ongoing NFI becomes available. The Czech Republic is in the process of conducting a field sampling campaign to be finalized by the end of 2014 or early in 2015 as part of NFI. This process should provide the relevant data to allow the verification of biomass increment values of young forests stands up to 20 years based on tree species composition. Therefore, the ERT reiterates the recommendation made in previous review reports that the Czech Republic use the results of the next NFI, when they are available.

F. Waste

1. Sector overview

74. In 2012, emissions from the waste sector amounted to 3,766.54 Gg CO_2 eq, or 2.9 per cent of total GHG emissions. Since 1990, emissions have increased by 33.4 per cent. The key driver for the rise in emissions is the growth of CH_4 emissions from solid waste disposal on land resulting from an increased amount of solid organic waste disposed on landfills. Within the sector, 73.5 per cent of the emissions were from solid waste disposal on land, followed by 20.9 per cent from wastewater handling and 5.6 per cent from waste incineration. Emissions from other (waste) were reported as "NA".

75. The Czech Republic has not made recalculations between the 2013 and 2014 annual submissions for this sector.

76. During 2013 the QA/QC plan for the waste sector was updated and category-specific QA/QC procedures were implemented. Nevertheless, the ERT identified some typographical errors (e.g. NIR table 8-12) and discrepancies between the data in the CRF tables and in the NIR (e.g. incorrect values for CH_4 recovery and CH_4 emissions for 2011 reported in the NIR; an incorrect number of capturing landfills reported in the NIR). The ERT recommends that the Czech Republic more strictly apply verification and QA/QC procedures.

77. The NIR states that the Czech Republic plans to review the industrial wastewater source category and recalculate the emissions according to the new findings available since the Ministry of Industry and Trade commenced gathering data on water treatment and gas production. The ERT commends the Czech Republic for the planned improvement.

2. Key categories

Solid waste disposal on land – CH_4

78. The IPCC first-order decay method was used to estimate CH_4 emissions from solid waste disposal on land. In response to a question raised by the ERT during the review, the Czech Republic provided the spreadsheets containing the calculations used to apply the model. The evaluation of the spreadsheets, AD and EFs used enabled the ERT to conclude that the method was applied in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The ERT noted that for the entire time series 1990–2012 the Czech Republic reported only managed solid waste disposal sites. In the early 1990s it was common that some solid waste disposal sites were unmanaged in some European countries. In response to a question raised by the ERT during the previous review, the Czech Republic explained that in the Czech Republic waste legislation had been established before the European Union (EU) landfill directive, and management conditions of landfills had been gradually improving even before 1990. The ERT reiterates the recommendation made in the previous review report that the Czech Republic improve the transparency of the inventory and include this information, together with the description of the national legislation concerning landfill management practices, in its NIR.

79. The Czech Republic has not followed the recommendations made in the previous review report to provide information on the reasons for using a constant value for the data on waste composition for the period 2009–2012 in the NIR. Given that waste composition usually changes quite slowly, the ERT agrees that it would be acceptable to use a constant value for waste composition for a limited number of years if yearly data are not available. Furthermore, the NIR does not include information on waste composition for the years 1950–1989, although the data are available in spreadsheets containing the calculations used to apply the model, which were provided during the review. The ERT reiterates the recommendation made in the previous review report that the Czech Republic improve the

transparency of the inventory and include waste composition data, including degradable organic carbon (DOC) values for all the years, in its NIR. The ERT also recommends that the Party update the information on waste composition for future years.

Wastewater handling – CH_4 and N_2O[9]

80. The Party used the tier 1 approach together with default EFs from the Revised 1996 IPCC Guidelines and country-specific AD reflecting the current wastewater treatment technologies to estimate CH_4 and N_2O emissions from domestic and commercial wastewater handling. The ERT considers that this is in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

81. The N_2O emissions from human sewage were calculated according to the default IPCC method. The value of protein consumption per capita per year (33.65 kg N/ kg protein) was taken from the database of the Food and Agriculture Organization of the United Nations (FAO). For the period 2009–2012 protein consumption was assumed to be at the level of data for 2009 because of a lack of data in the FAO database after 2009. The ERT agrees with this estimation. Noting the fact that the new FAO database is available from 16 September 2014, the ERT recommends that the Czech Republic use the latest available data.

3. Non-key categories

Waste incineration – CO_2, CH_4 and N_2O

82. To estimate emissions of CO_2, CH_4 and N_2O from waste incineration the Party used the default method described in the IPCC good practice guidance with the default values and country-specific AD. The Czech Republic reports emissions from the incineration of municipal solid waste (MSW) in the energy sector because MSW is incinerated in energy recovery facilities. In the waste sector only the emissions from waste incineration without energy recovery were reported. CO_2 emissions of biogenic and non-biogenic origins were estimated and reported separately. The ERT concluded that the reporting is in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

83. The ERT noted that the Party did not follow the recommendation made in the previous review report to include information regarding the decreasing trend of waste incinerated. To further improve the transparency of the inventory, the ERT reiterates the recommendation made in previous review report that the Czech Republic include this information in the NIR.

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

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

Overview

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

[9] N2O emissions from this category are not key. However, since all issues relating to this category are discussed as a whole, the individual gases are not assessed in separate sections.

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

Issue	*Expert review team assessment, if applicable*	*Findings and recommendations*
Assessment of the Party's reporting in accordance with the requirements in paragraphs 5–9 of the annex to decision 15/CMP.1	Sufficient	
Activities elected under Article 3, paragraph 4, of the Kyoto Protocol	Forest management Years reported: 2008, 2009, 2010, 2011, 2012	
Period of accounting		Commitment period accounting
Party's ability to identify areas of land and areas of land-use change in accordance with paragraph 20 of the annex to decision 16/CMP.1	Sufficient	The Czech Republic provided transparent land-use matrices and land-use transitions and updated information in its 2014 NIR clarifying the origin of the observed residual discrepancies in land-use areas and land-use transitions The Czech Republic provided spatially explicit information of individual cadastral units (n = 13,000 as of 2012), disaggregated by 10 land-use types from 1969–2012

Abbreviation: NIR = national inventory report.

85. Section G.I includes the ERT's assessment of the 2014 annual submission against the Article 8 review guidelines and decisions 15/CMP.1 and 16/CMP.1. In accordance with decision 6/CMP.9, Parties will begin reporting of KP-LULUCF activities in the submissions due by 15 April 2015 using revised CRF tables, as contained in the annex to decision 6/CMP.9. Owing to this change in the CRF tables for KP-LULUCF activities, and the change from the first commitment period to the second commitment period, paragraphs 86–92 below contain the ERT's assessment of the Party's adherence to the current guidelines for reporting and do not provide specific recommendations for reporting of these activities for the 2015 annual submission.

86. In table NIR-1, the Party states that it has reported all the carbon pools. The ERT noted, however, that carbon stock changes for the deadwood, litter and soil carbon pools for forest management are reported as "NO", while paragraph 6(e) of the annex to 15/CMP.1 and paragraph 21 of the annex to 16/CMP.1 require that the Party report all carbon pools including soil organic carbon. The Party provided evidence that these carbon pools are not a net source of emissions in the NIR (section 11.3.1.2). Thus for the dead wood pool in CRF table NIR-1 the notation key "R" (reported) is used for the activities afforestation/reforestation and forest management. However, the Party reports these carbon stock changes as "NO" in CRF tables 5(KP-I)A.1.1 and 5(KP-I)B.1 together with verifiable information in the NIR that these pools are not net sources. The ERT considers that the reporting in table NIR-1 is not consistent with the other tables, and therefore recommends

that the Party report the correct notation key "NR" (not reported) in CRF table NIR-1. The ERT further reiterates the encouragement made in the previous review reports that the Czech Republic use the results of the second NFI, when they are available, to estimate the carbon stock changes in the dead wood pool for forest management.

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

Afforestation and reforestation – CO_2

87. The ERT acknowledges the implementation of updated information on land-use representation and identification using revised cadastral map information in the 2014 NIR, which was recommended in the previous review report. Moreover, the Party has also provided spatially explicit information by individual cadastral units. However, the ERT encourages the Party to further disaggregate by land-use type within cadastral units in order to ensure that the conversion of forest areas classified as deforested land is distinguished from afforestation and reforestation taking place on other land. The ERT noted that in the 2014 annual submission the Party has also addressed the recommendation made in the previous review report to provide transparent information on the legislation and regulations (administrative decisions) used to define units of lands subject to deforestation and afforestation/reforestation.

88. The ERT notes that the Party continues to report emission estimates of GHGs from biomass burning restricted to areas under forest management, while emissions from other areas are reported as "NO" in CRF table 5(KP-II)5. These estimates are based on the reporting on forest land remaining forest land under the LULUCF sector. However, as noted in the previous review report, in the LULUCF sector, the areas of land converted to forest land are moved to the category forest land remaining forest land after a 20-year period (i.e. areas converted to forest in 1990 were reported as forest land remaining forest land in 2010, although these areas remain under afforestation/reforestation activities). The ERT noted that it is not clear in the Party's annual submission whether biomass burning occurred on these areas and, in particular, the ERT noted that, if biomass burning does occur, it would have to be reported under afforestation/reforestation and not under forest management. In response to a question raised by the ERT during the review, the Party indicated that wildfires remain infrequent and limited in extent to areas where there is a significant build-up of fuel; that is, in older stands with closed canopies and with significant litter. The Party considers that these conditions are not met by the newly afforested/ reforested areas where the burnable material load has not yet accumulated. The Party further provided information on areas (ha) for wildfires for the whole time series 1990–2012 that will be included in future annual submissions. The ERT concluded that the data provided during the review week were adequate and agreed that the approach to provide data on wild fires for the whole time series in future submissions will help to increase the transparency of reporting and enable an accurate assessment to be made of emission estimates from wild fires.

Deforestation – CO_2

89. The ERT notes that in the 2014 NIR the Czech Republic improved the system for land-use representation and identification using revised cadastral map information (see para. 87 above). The ERT notes that despite the improvements made to land-use representation, information on tracking of deforested lands is still lacking. During the review, in response to questions raised by the ERT, the Party indicated that improvements on tracking of deforested land will be possible once NFI is completed in 2014 or 2015. The ERT recognized the overall progress in land representation achieved by the Party and the efforts undertaken to track land deforested lands through the development of NFI (which is at the finalization stage). However, the ERT reiterates the recommendation made in the 2012 and 2013 review reports that the Party improve the tracking of deforested lands,

including information on subsequent land-use changes and the management practices applied to them (e.g. practices leading to changes in soil organic carbon, the application of lime and the burning of biomass) in order to enhance the accuracy of its reporting, once information from NFI becomes available.

90. The Czech Republic states in the NIR that there are three data sets on forests available in the country: forest management plans (FMPs); data from the first survey of NFI; and the statistical source CzechTerra. These differ in their results, particularly regarding the volume of the stock of living biomass in the forest: FMPs report 262 m^3/ha; NFI reports 328 m^3/ha; and CzechTerra reports 305 m^3/ha. The previous review report noted that applying the volume of the stock of living biomass from FMPs results in lower emissions from deforestation in comparison with applying the values from NFI or CzechTerra. The previous review report strongly recommended that the Czech Republic provide additional information demonstrating that applying the stock of biomass from FMPs is accurate or, if it cannot provide that information, apply a value for biomass stock that avoids underestimation of emissions from deforestation. In response to questions raised by the ERT during the current review, the Party indicated that FMPs use stand level data, which fulfils international reporting requirements in terms of consistency of the time series. However, both NFI and CzechTerra programmes have only completed one pilot inventory cycle and therefore are not readily available for use in estimating carbon stock change. The Party further explained that unresolved issues remain with NFI volumes and these can be addressed once the NFI cycle is completed by 2014 or 2015, and for this reason the Party continues to use data from FMPs. The ERT agrees that for reliable biomass stock data at least one more NFI cycle is needed. Therefore, the ERT accepted the reasoning and approach behind the continued use of data from FMPs, and concluded that the emissions from the activity are not underestimated using the best available data, given that NFI data are still in the final stages of development.

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

Forest management – CO_2

91. The ERT noted that carbon stock change in dead wood is reported as "NO" with an explanation provided in the NIR (chapter 11.3.1.2), which states that carbon stock change in dead wood in forest management areas is assumed to be equal to zero, and therefore reported as "NO". The Czech Republic has applied the tier 1 approach from the IPCC good practice guidance for LULUCF assuming that carbon stocks in DOM are constant over time (i.e. carbon stock change is reported as "NO"). In the 2014 NIR submission, the Party provided empirical data for the justification that the DOM carbon pool is not a net source and will use data from NFI and CzechTerra to verify the identical assessment from the empirical studies. The ERT agreed that the Party provided adequate information to justify that DOM is not a net source and encourages the Party to use the information from NFI, when this becomes available, to enhance the transparency of reporting for all carbon pools.

92. The ERT noted that the Party reports two subdivisions: "forest land remaining forest land in KP reporting" and "residual afforested land from before 1990 (in conversion status)". AD and emissions for this latter subdivision are reported as "NO" since 2009 (inclusive) (the time the land converted to forest land under the Convention moved to the permanent forest land category – 20-year default conversion status). In response to questions raised by the ERT during the review, the Party indicated that residual afforested land is an integral part of the forest management area, as it has been afforested prior to 1990 (during the years 1970 and 1989), and the Party included residual afforestation values in the 2014 NIR (table 11.2, page 218) to increase transparency. The ERT concluded that the inclusion of the residual afforestation estimates into the forest management total estimates does not lead to an overestimation of removals from forest management for the year 2008. The ERT acknowledges that the inclusion of the two subdivisions does improve

transparency, as they are likely to have different emission/removal methods applied. Furthermore, as the land converted to forest land before 1990 will move into the category forest land remaining forest land after 20 years, the land conversion category will become "NO" after 2009.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

93. 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 recommendations included in the standard independent assessment report (SIAR) on the SEF tables and the SEF comparison report.[10] The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the main findings and recommendations contained in the SIAR.

94. 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.2 and the annex to decision 13/CMP.1. No discrepancy has been identified by the ITL and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

Accounting of activities under Article 3, paragraph 3, of the Kyoto Protocol and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol

95. The Czech Republic has reported information on its accounting of KP-LULUCF in the accounting table, as included in the annex to decision 6/CMP.3. Information on the accounting of KP-LULUCF has been prepared and reported in accordance with decisions 16/CMP.1 and 6/CMP.3.

96. Table 7 shows the accounting quantities for KP-LULUCF as reported by the Party and the final values after the review.

Table 7
Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol, in t CO_2 eq

	2014 annual submission[a]		
	As reported	*Revised estimates*	*Final accounting quantity*[b]
Afforestation and reforestation			
Non-harvested land	–1 571 674		–1 571 674
Harvested land	NO		NO
Deforestation	854 212		854 212
Forest management	–5 866 667		–5 866 667
Article 3.3 offset[c]	0		0

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

	2014 annual submission[a]		
	As reported	*Revised estimates*	*Final accounting quantity*[b]
Forest management cap[d]	–5 866 667		–5 866 667
Cropland management	NA		NA
Grazing land management	NA		NA
Revegetation	NA		NA

Abbreviations: CRF = common reporting format, KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] The values included under the 2014 annual submission are the cumulative accounting values for 2008, 2009, 2010, 2011 and 2012, as reported in the accounting table of the KP-LULUCF CRF tables for the inventory year 2012.

[b] The "final accounting quantity" is the quantity of Kyoto Protocol units that the Party shall issue or cancel under each activity under Article 3, paragraph 3, and paragraph 4, if relevant, based on the final accounting quantity in the 2014 annual submission.

[c] "Article 3.3 offset": for the first commitment period, a Party included in Annex I to the Convention that incurs a net source of emissions under the provisions of Article 3, paragraph 3, of the Kyoto Protocol may account for anthropogenic greenhouse gas emissions by sources and removals by sinks in areas under forest management under Article 3, paragraph 4, up to a level that is equal to the net source of emissions under the provisions of Article 3, paragraph 3, but not greater than 9.0 megatonnes of carbon times five, if the total anthropogenic greenhouse gas emissions by sources and removals by sinks in the managed forest since 1990 is equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

[d] In accordance with decision 16/CMP.1, annex, paragraph 11, for the first commitment period only, additions to and subtractions from the assigned amount of a Party resulting from forest management under Article 3, paragraph 4, of the Kyoto Protocol after the application of decision 16/CMP.1, annex, paragraph 10, and resulting from forest management project activities undertaken under Article 6, shall not exceed the value inscribed in the appendix of the annex to decision 16/CMP.1, times five.

97. Based on the information provided in table 7 for the activity afforestation and reforestation, the Czech Republic shall: for non-harvested land, issue 1,571,674 removal units (RMUs) in its national registry; and for harvested land, neither issue nor cancel any units.

98. Based on the information provided in table 7 for the activity deforestation, the Czech Republic shall cancel 854,212 assigned amount units, emission reduction units, certified emission reduction units and/or RMUs in its national registry.

99. Based on the information provided in table 7 for the activity forest management, the Czech Republic shall issue 5,866,667 RMUs in its national registry.

Calculation of the commitment period reserve

100. The Czech Republic has reported its commitment period reserve in its 2014 annual submission. The Czech Republic reported its commitment period reserve to be 657,330,575 t CO_2 eq based on the national emissions in its most recently reviewed inventory (131,466,115 Gg CO_2 eq). The ERT notes that based on the submission of revised emission estimates by the Czech Republic during the review of the 2014 annual submission, the commitment period reserve changed, and the new commitment period reserve is reported as 657,330,150 t CO_2 eq based on the revised national emissions in 2012 (131,466,030 Gg CO_2 eq). The ERT agrees with this figure.

3. Changes to the national system

101. The Czech Republic did not provide information on changes to its national system in its annual submission. However, in response to questions raised by the ERT during the review, the Party provided the information that there are no changes in the national system

since the previous annual submission. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems set out in decision 19/CMP.1. The ERT recommends that the Party report in its annual submission any change in its national system in accordance with decision 15/CMP.1, annex, chapter I.F, and/or further relevant decisions of the CMP.

4. Changes to the national registry

102. The Czech Republic reported that there are changes in its national registry since the previous annual submission. In the NIR, the Party described the changes, consisting of the consolidation of its registry with the registries of other EU member States and in the appointment of a new registry administrator. The consolidation of the registry is a result of the decision of EU member States that are also Parties to the Kyoto Protocol and of Iceland, Liechtenstein and Norway to operate their registries in a consolidated manner and the process concluded in June 2012. However, the ERT noted that the information on the consolidation of the registries had already been included in the 2013 annual submission. The current submission provides information on the follow-up test procedures conducted in 2013 and February 2014.

103. The ERT noted in the SIAR that the national registry has not fulfilled the requirements regarding the public availability of information, in accordance with section II.E of the annex to decision 13/CMP.1, and that the SIAR assessor recommends that the Party provide non-confidential up-to-date holding and transaction information in its publicly available information. In the NIR, the Party states that the annual review report for the 2013 centralized review was not published until 2014; however, the ERT noted that the same recommendation had been included in the 2012 annual review report, and therefore it was made known to the Party. The ERT reiterates the recommendation made in the previous review reports that the Party include non-confidential up-to-date holding and transaction information in its publicly available information.

104. 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

105. Consistent with paragraph 23 of the annex to decision 15/CMP.1, the Czech Republic provided information relating to how it is striving, under Article 3, paragraph 14, of the Kyoto Protocol, to implement its commitments in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention.

106. In its 2014 NIR, the Czech Republic underlined that, being a member State of the EU, its policies and measures, in particular those concerning the energy sector (such as liberalization of energy markets, harmonization of consumption taxes for electricity and fossil fuels, emissions trading), are based on the transposition of EU directives. EU directives are generally subject to an impact assessment, which ensures minimization of their potential adverse social, environmental and economic impacts on various stakeholders, including developing country Parties.

107. In addition, in its NIR the Party has listed a series of research initiatives on technologies, such as carbon dioxide capture and storage, and a project supporting

technology and capacity development through development assistance for the modernization of power generation and the control of a power plant block in Mongolia. The Czech Republic has also listed several cooperative initiatives with Parties not included in Annex I to the Convention (Georgia, Bosnia and Herzegovina, Viet Nam and Cambodia).

108. The Czech Republic did not provide information on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol in its annual submission, in accordance with decision 15/CMP.1, annex, chapter I.H. In response to questions raised by the ERT during the review, the Party stated that there were only minor developments since the 2013 annual submission and that the information provided with the previous annual submission is still relevant. The ERT concluded that the information provided continues to be complete and transparent. The ERT recommends that the Party, in its annual submission, report any changes in its information provided under Article 3, paragraph 14, in accordance with decision 15/CMP.1, annex, chapter I.H, and/or further relevant decisions of the CMP.

III. Conclusions and recommendations

A. Conclusions

109. Table 8 summarizes the ERT's conclusions on the 2014 annual submission of the Czech Republic, in accordance with the Article 8 review guidelines.

Table 8
Expert review team's conclusions on the 2014 annual submission of the Czech Republic

Issue	*Expert review team assessment*	*Paragraph cross-references for identified problems*
The ERT concludes that the inventory submission of the Czech Republic is complete with regard to categories, gases, years and geographical boundaries and contains both an NIR and CRF tables for 1990–2012		
Annex A sources[a]	Complete	
LULUCF[a]	Complete	
KP-LULUCF	Complete	
The ERT concludes that the inventory submission of the Czech Republic has been prepared and reported in accordance with the UNFCCC reporting guidelines	Generally	Tables 3, 4 and 5
The Party's inventory is in accordance with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF	Yes	
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	Generally	89, 108
The Party 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	Yes	

Issue	*Expert review team assessment*	*Paragraph cross-references for identified problems*
tables as specified by decision 14/CMP.1		
The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1	Yes	
The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions	Yes	
Did the Party provide information in the NIR on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol?	No	108

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, CRF = common reporting format, ERT = expert review team, IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, Revised 1996 IPCC Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Revised 1996 IPCC Guidelines, the IPCC good practice guidance or the IPCC good practice guidance for LULUCF).

B. Recommendations

110. The ERT identified the issues for improvement listed in table 9. All recommendations are for the next annual submission, unless otherwise specified.

Table 9
Recommendations identified by the expert review team

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
Cross-cutting	QA/QC	Enforce the sector-specific QA/QC procedures and report on the respective category-specific checks and results in the NIR	Yes	Table 3
	Transparency	Enhance the transparency of the NIR by reporting information in the sectoral chapters under the correct headings, and by providing more detailed information on the methods and EFs used for the calculation of emission estimates, as well as a description of data sources and assumption used	Yes	Table 3
	Inventory	Strengthen the capacity of the national system by	No	12a

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
	preparation	solving the issues of budget restrictions and staff shortages		
		Improve the accuracy of the inventory further by moving to higher-tier estimation methods, prioritizing the introduction of these methods on the basis of the key category and uncertainty analyses	No	12b
		Continue its work on sector- and category-specific QA/QC procedures and provide information on their progress	Yes	13
	Uncertainty analysis	Report the uncertainty analysis both including and excluding the LULUCF sector	No	Table 4
Energy	Recalculations	Improve the transparency of reporting of the recalculations including the changes in the AD used and the impact of the recalculations made	No	20
	Uncertainty analysis	Provide a full elaboration of the method of expert judgement used to improve the uncertainty values	Yes	21
	QA/QC	Continue the work done so far in order to improve the QA/QC procedures (e.g. for ensuring consistent reporting between tables 1.A(b), 1.A(c) and 1.A(d) for the reference approach) and to avoid typographical errors	Yes	22, 33
	Reference approach	Address the issue of data alignment between the data reported to IEA and the data in the CRF tables and adequately explain any remaining differences	Yes	25
	Feedstock and non-energy use of fuels	Include more detailed explanations of the distribution and use of the liquid fuels used as feedstocks in the energy sector in CRF table 1.A(d) and in the NIR	No	27
	Stationary combustion: solid fuels – CO_2	Include further information about the country-specific CO_2 EF for the use of solid fuels in manufacture of solid fuels and other energy industries in the NIR	No	29
	Road transportation: liquid fuels – N_2O	Include more detailed information about the different vehicle technologies and their shares in the road transportation sector	No	30
	Other transportation: gaseous fuels –	Include detailed information to explain and justify the difference in the CO_2 IEF of the gaseous fuel used in different subcategories (road	No	31

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
	CO_2	transportation and pipeline transport)		
	Coal mining and handling: solid fuels – CH_4	Ensure time-series consistency for historical data used to estimate the emissions from solid fuels (underground mines)	No	32
Industrial processes and solvent and other product use	Nitric acid production – N_2O	Include in the NIR the information on the AD, as provided to the ERT during the review, and any further relevant information following the planned change in the data sources	No	37
	Iron and steel production – CO_2	Include information on the changes in iron and steel processes in the NIR	Yes	38
	Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6	Consistently implement the new methods, data sources and EFs for the estimation of emissions from refrigeration and mobile air conditioning and transparently document the underlying information in the NIR specifying, in particular, from which subcategories (domestic, commercial, industrial and transport refrigeration, mobile and stationary air conditioning) the emissions come and providing documentation on the AD sources, lifetimes and EFs used	No	40
		Describe in the NIR how the percentage of the F-gases captured and the percentage of the F-gases emitted are identified and explain the storage of large amounts of F-gases practiced in the country	No	41
		Strengthen the QA/QC procedure before submitting the NIR and include the relevant methodological information for the HFC estimates for foam blowing in the NIR	No	42
		Identify the number of producers of semiconductors, add a description of the trend of F-gas emissions (reasons for the gaps in and cessation of the use of F-gases) and provide details on the method and EFs used	No	43
		Justify the trend in the emissions of SF_6 from stocks for soundproof windows in the NIR	No	44
		Further investigate any possible other uses of SF_6 (military, scientific or other), and if they occur, estimate and report these emissions to ensure completeness of the estimates	No	45

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
	Aluminium production – PFCs	Include in the NIR information justifying why the CO_2, CH_4 and PFC emissions are reported as not occurring, together with an explanation of the cover salts (fluxes) method	No	46
Agriculture	Recalculations	Reallocate all information concerning recalculations, report it in the category-specific subchapters of the NIR and clearly distinguish the recalculations of the current annual submission from recalculations made during previous annual submissions	No	48
	QA/QC	Enforce the sector-specific QA/QC analysis and report on the category-specific checks and results in the category-specific subchapters of the NIR	Yes	49
	Enteric fermentation – CH_4	Correct the erroneous reporting of the values for body weights in the NIR and transparently describe how time-series consistency is assured in the relevant subchapter of the NIR	No	52
	Manure management – CH_4	Improve transparency of the reporting within the category for non-dairy cattle	No	57
		Consistently report the distribution of animal waste management systems across all emission categories in the NIR as well as in CRF tables 4.B(a) and 4.B(b)	No	57a
		Provide the data used to estimate the weighted EF for non-dairy cattle on an animal subcategory level in the NIR, including livestock population statistics, body weight, excretion of VS, B_0 and animal waste management system allocation	No	57b
		Provide in the NIR all background information on the development of agricultural policies and structures that support the trends in animal waste management system allocation	No	57c
		Ensure time-series consistency of the estimates	No	57d
		Include data on weight, B_0 and VS for dairy and non-dairy cattle in CRF tables 4.A and 4.B(a)	No	58
	Direct soil emissions – N_2O	Enhance the explanations for this category, among other ways by including the information on parameters related to crop residues and nitrogen-fixation (crop yields, $Frac_{DM}$, $Frac_{NCRO}$, $Frac_{NCRBF}$, Res/Crop) provided to the ERT	Yes	61

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
		during the review		
		Increase the transparency of reporting of N_2O emissions from sewage sludge in the NIR by clearly stating where the emissions are reported and for what reason	No	62
		Consider reporting separately N_2O emissions from sewage sludge used as fertilizer in agriculture under the category agricultural soils	No	62
	Indirect emissions – N_2O	Improve reporting of indirect emissions from soils and harmonize the reporting of ammonia emissions to different international bodies	Yes	63
LULUCF	Carbon stock changes in mineral soils	Develop country-specific reference carbon stocks values/change factors associated with the tillage and input regimes for the estimates of mineral soils carbon stock change	No	69
	Forest land remaining forest land – CO_2	Use the results of the next NFI, when they are available, to estimate the carbon stock changes in the dead organic matter pool	Yes	71
	Land converted to forest land – CO_2	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	Yes	72
		Revise the biomass increment value for land converted to forest land once the information from the ongoing NFI becomes available	Yes	73
Waste	QA/QC	More strictly apply verification and QA/QC procedures	Yes	76
	Solid waste disposal on land – CH_4	Improve the transparency of the inventory and include this information, together with a description of the national legislation concerning landfill management practices, in the NIR	Yes	78
		Improve the transparency of the inventory and include waste composition data, including the degradable organic carbon values, for all years in the NIR	Yes	79
		Update the information on waste composition	No	79
	Wastewater	Use the latest available FAO data for the value	No	81

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation?*	*Paragraph cross-references*
	handling –N_2O	of protein consumption per capita per year		
	Waste incineration – CO_2, CH_4 and N_2O	Improve the transparency of the inventory and include in the NIR information regarding the decreasing trend of waste incinerated	Yes	83
National system		Report any change in its national system in accordance with decision 15/CMP.1, annex, chapter I.F, and/or further relevant decisions of the CMP	No	101
National registry		Include non-confidential up-to-date holding and transaction information in its publicly available information	Yes	103
Article 3, paragraph 14		Report any changes in its information provided under Article 3, paragraph 14, in accordance with decision 15/CMP.1, annex, chapter I.H, and/or further relevant decisions of the CMP	No	108

Abbreviations: AD = activity data, B_0 = methane producing potentials, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, CRF = common reporting format, EF = emission factor, ERT = expert review team, $Frac_{DM}$, $Frac_{NCRO}$, $Frac_{NCRBF}$, Res/Crop = parameters related to crop residues and nitrogen-fixation, IEA = International Energy Agency, IEF = implied emission factor, FAO = Food and Agriculture Organization of the United Nations, F-gas = fluorinated gas, LULUCF = land use, land-use change and forestry, NFI = national forest inventory, NIR = national inventory report, QA/QC = quality assurance/quality control, VS = volatile solids.

IV. Questions of implementation

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

Annex I

Information to be included in the compilation and accounting database

Table 10
Information to be included in the compilation and accounting database in t CO_2 eq for 2012, including the commitment period reserve

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	**657 330 575**	**657 330 150**		**657 330 150**
Annex A emissions for 2012				
CO_2	111 301 871			111 301 871
CH_4	10 255 769			10 255 769
N_2O	7 727 049	7 726 964		7 726 964
HFCs	2 082 749			2 082 749
PFCs	6 569			6 569
SF_6	92 108			92 108
Total Annex A sources[c]	**131 466 115**	**131 466 030**		**131 466 030**
3.3 Afforestation and reforestation on non-harvested land for 2012	–369 937			–369 937
3.3 Afforestation and reforestation on harvested land for 2012	NO			NO
3.3 Deforestation for 2012	169 808			169 808
Activities under Article 3, paragraph 4, for 2012[d]				
3.4 Forest management for 2012	–6 911 287			–6 911 287
3.4 Cropland management for 2012				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2012				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2012				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.
[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 11
Information to be included in the compilation and accounting database in t CO_2 eq for 2011

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2011				
CO_2	115 069 256			115 069 256
CH_4	10 329 504	10 330 296		10 330 296
N_2O	7 860 515	7 859 733		7 859 733
HFCs	1 924 517			1 924 517
PFCs	9 075			9 075
SF_6	83 674			83 674
Total Annex A sources[c]	**135 276 541**	**135 276 550**		**135 276 550**
Activities under Article 3, paragraph 3, for 2011				
3.3 Afforestation and reforestation on non-harvested land for 2011	–346 733			–346 733
3.3 Afforestation and reforestation on harvested land for 2011	NO			NO
3.3 Deforestation for 2011	160 245			160 245
Activities under Article 3, paragraph 4, for 2011[d]				
3.4 Forest management for 2011	–6 630 568			–6 630 568
3.4 Cropland management for 2011				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2011				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2011				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 12
Information to be included in the compilation and accounting database in t CO_2 eq for 2010

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2010				
CO_2	117 141 139			117 141 139
CH_4	10 369 069	10 370 402		10 370 402
N_2O	7 700 670	7 699 986		7 699 986
HFCs	1 688 821			1 688 821
PFCs	36 658			36 658
SF_6	71 453			71 453
Total Annex A sources[c]	**137 007 811**	**137 008 460**		**137 008 460**
Activities under Article 3, paragraph 3, for 2010				
3.3 Afforestation and reforestation on non-harvested land for 2010	–309 681			–309 681
3.3 Afforestation and reforestation on harvested land for 2010	NO			NO
3.3 Deforestation for 2010	202 037			202 037
Activities under Article 3, paragraph 4, for 2010[d]				
3.4 Forest management for 2010	–4 799 378			–4 799 378
3.4 Cropland management for 2010				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2010				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2010				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 13
Information to be included in the compilation and accounting database in t CO_2 eq for 2009

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2009				
CO_2	114 471 946			114 471 946
CH_4	10 208 341	10 202 316		10 202 316
N_2O	7 962 922	7 978 636		7 978 636
HFCs	1 423 872			1 423 872
PFCs	33 133			33 133
SF_6	105 450			105 450
Total Annex A sources[c]	**134 205 664**	**134 215 353**		**134 215 353**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009	–283 758			–283 758
3.3 Afforestation and reforestation on harvested land for 2009	NO			NO
3.3 Deforestation for 2009	165 953			165 953
Activities under Article 3, paragraph 4, for 2009[d]				
3.4 Forest management for 2009	–6 118 734			–6 118 734
3.4 Cropland management for 2009				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2009				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 14
Information to be included in the compilation and accounting database in t CO_2 eq for 2008

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2008				
CO_2	121 731 454			121 731 454
CH_4	10 523 321	10 517 453		10 517 453
N_2O	8 492 322	8 497 126		8 497 126
HFCs	1 314 120			1 314 120
PFCs	28 234			28 234
SF_6	95 185			95 185
Total Annex A sources[c]	**142 184 637**	**142 183 573**		**142 183 573**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008	–261 565			–261 565
3.3 Afforestation and reforestation on harvested land for 2008	NO			NO
3.3 Deforestation for 2008	156 169			156 169
Activities under Article 3, paragraph 4, for 2008[d]				
3.4 Forest management for 2008	–4 081 061			–4 081 061
3.4 Cropland management for 2008				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2008				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Annex II

Documents and information used during the review

A. Reference documents

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

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FCCC/ARR/2013/CZE. Report of the individual review of the annual submission of the Czech Republic submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/cze.pdf>.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Ondřej Miňovský (the Czech Hydrometeorological Institute), including additional material on the methodology and assumptions used.

Annex III

Acronyms and abbreviations

B_0	methane producing potentials
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
CZSO	Czech Statistical Office
DOM	dead organic matter
EF	emission factor
ERT	expert review team
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
F-gas	fluorinated gas
FMP	forest management plan
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
ha	hectare
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1,000 grams)
KP-LULUCF	land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MSW	municipal solid waste
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NFI	National Forest Inventory
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
RMU	removal unit
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change
VS	volatile solids