Report of the individual review of the annual submission of the Czech Republic submitted in 2009

Note by the secretariat

The report of the individual review of the annual submission of the Czech Republic submitted in 2009 was published on 17 March 2010. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2009/CZE, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

UNITED NATIONS

UNFCCC Framework Convention
on Climate Change

Distr.
GENERAL

FCCC/ARR/2009/CZE
17 March 2010

ENGLISH ONLY

Report of the individual review of the annual submission of the Czech Republic submitted in 2009[*]

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I. Executive summary

A. Introduction

1.   This report covers the in-country review of the 2009 annual submission of the Czech Republic, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 12 to 17 October 2009 in Prague, Czech Republic, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Michael McGettigan (Ireland); energy – Mr. Joost Huurman (Netherlands); industrial processes – Mr. Eilev Gjerald (Norway); agriculture – Ms. Tajda Mekinda-Majaron (Slovenia); land use, land-use change and forestry (LULUCF) – Mr. Leandro Buendia (Philippines); and waste – Ms. Sirintornthep Towprayoon (Thailand). Mr. McGettigan and Ms. Towprayoon were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone (UNFCCC secretariat).

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

B. Emission profiles and trends

3.   In 2007, the main greenhouse gas (GHG) in the Czech Republic was carbon dioxide (CO_2), accounting for 86.2 per cent of total GHG emissions[1] expressed in CO_2 eq, followed by methane (CH_4) (7.8 per cent) and nitrous oxide (N_2O) (5.0 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.1 per cent of the overall GHG emissions in the country. The energy sector accounted for 81.8 per cent of the total GHG emissions, followed by the industrial processes sector (10.3 per cent), the agriculture sector (5.2 per cent), the waste sector (2.4 per cent), and the solvent and other product use sector (0.3 per cent). Total GHG emissions amounted to 150,823.32 Gg CO_2 eq and were by 22.5 per cent lower than the base year.[2] Total emissions were very stable between 2000 and 2007.

4.   Tables 1 and 2 show GHG emissions by gas and by sector, respectively. Table 1 includes emissions from Annex A sources only and excludes emissions and removals from the LULUCF sector.

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

[2]   "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources only.

Table 1. Total greenhouse gas emissions by gas, 1990–2007[a]

Greenhouse gas	Gg CO₂ eq								Change base year–2007 (per cent)
	Base year[b]	1990	1995	2000	2004	2005	2006	2007	
CO_2	164 332.38	164 332.38	131 395.73	127 138.19	127 032.65	126 375.32	128 615.33	129 949.92	−20.9
CH_4	18 461.46	18 461.46	13 644.30	12 084.68	11 547.97	11 644.51	12 094.30	11 701.55	−36.6
N_2O	11 840.80	11 840.80	8 084.00	7 598.18	7 810.71	7 539.28	7 419.30	7 470.22	−36.9
HFCs	0.73	NA, NE, NO	0.73	262.50	600.30	594.22	872.35	1 605.62	218 500.4
PFCs	0.12	NA, NE, NO	0.12	8.81	17.33	10.08	22.56	20.16	16 357.5
SF_6	75.20	77.68	75.20	141.92	51.89	85.88	83.07	75.85	0.9

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

[a] "Total greenhouse gas emissions" includes emissions from Annex A sources only (exclude emissions/removals from the LULUCF sector).

[b] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources only.

Table 2. Greenhouse gas emissions by sector, 1990–2007

Sector	Gg CO₂ eq								Change base year–2007 (per cent)
	Base year	1990	1995	2000	2004	2005	2006	2007	
Energy	156 234.78	156 234.78	125 521.00	121 418.44	120 155.71	120 902.20	122 390.02	123 330.48	−21.1
Industrial processes	19 594.05	19 595.67	14 310.50	13 609.83	15 011.04	13 649.92	15 054.87	15 593.00	−20.4
Solvent and other product use	764.83	764.83	596.31	568.56	519.28	513.77	512.93	512.17	−33.0
Agriculture	15 467.44	15 467.44	9 579.73	8 387.14	8 037.49	7 764.64	7 669.69	7 837.74	−49.3
LULUCF	NA	−4 564.72	−8 207.11	−8 572.88	−7 211.39	−7 707.98	−4 452.42	−1 719.88	NA
Waste	2 649.59	2 649.59	3 192.54	3 250.32	3 337.30	3 418.75	3 479.41	3 549.92	34.0
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	190 147.59	144 992.97	138 661.39	139 849.45	138 541.31	144 654.49	149 103.44	NA
Total (without LULUCF)	194 710.70	194 712.32	153 200.08	147 234.28	147 060.83	146 249.28	149 106.92	150 823.32	−22.5

Abbreviations: LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] "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 includes emissions from Annex A sources only.

C. Main findings

5.   The inventory is generally in line with the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and with most of the elements of the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). However, the expert review team (ERT) found that tier 2 methods were not used for the majority of key categories and the 2009 submission does not fully meet the requirements of the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines) with respect to transparency, especially for the energy sector. The ERT notes in particular that the Czech Republic did not submit a quality assurance/quality control (QA/QC) plan in its 2009 submission, as requested in previous review reports, and the lack of such a plan makes it very difficult to assess the scope and implementation of QA/QC for the inventory. The ERT reminded the Party that QA/QC is a mandatory requirement for implementation of the national system and it is fundamental to the proper development and improvement of the annual inventory.

6.   The Czech Republic has submitted on a voluntary basis supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol in accordance with Part I of the annex to decision 15/CMP.1.

7.   The Czech Republic has reported on a voluntary basis information on activities under Article 3, paragraph 3, and on forest management under Article 3, paragraph 4, of the Kyoto Protocol in accordance with section I.D of the annex to decision 15/CMP.1.

8.   The Czech Republic has reported information on its accounting of Kyoto Protocol units in accordance with section I.E of the annex to decision 15/CMP.1 and has used the standard electronic format (SEF) tables as required by decision 14/CMP.1.

9.   The national system continues to perform most of the functions as set out in the annex to decision 19/CMP.1. However, a QA/QC plan had not been developed for the 2009 submission and the Party's archiving system needs further development to meet fully the requirements as set out in the annex to decision 19/CMP.1.

10.   The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) decisions.

11.   In the course of the review, the ERT formulated a number of recommendations relating to methodologies for key categories, implementation of a QA/QC plan and the transparency of the inventory for energy and industrial processes. The ERT encourages the Czech Republic to use the annotated outline of the national inventory report (NIR), and guidance contained therein, when preparing its 2010 NIR.[3]

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[3] <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/reporting_requirements/application/pdf/annotated_nir_outline.pdf>.

II. Overview

A. Annual submission and other sources of information

12.   The 2009 annual inventory submission was submitted on 14 April 2009 and contains a complete set of common reporting format (CRF) tables for the period 1990–2007 and an NIR. The Czech Republic also submitted information required under Article 7, paragraph 1, of the Kyoto Protocol, on 4 May 2009 including information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and the accounting of Kyoto Protocol units. The SEF tables were submitted on 15 April 2009. The annual submission was submitted in accordance with decision 15/CMP.1. The Party indicated that the 2009 submission is also its voluntary submission under the Kyoto Protocol.

13.   In addition, the ERT used Parts I and II of the standard independent assessment report (SIAR) to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.[4]

14.   During the review, the Czech Republic provided the ERT with additional information. The documents concerned are not part of the 2009 submission but are in many cases referenced in the NIR. The full list of materials used during the review is provided in annex I to this report.

Completeness of inventory

15.   The inventory covers all IPCC sectors and gases and most source and sink categories for the period 1990–2007 and is complete in terms of years and geographical coverage. In response to completeness issues raised by the ERT, the Czech Republic indicated that it would explore the possibility of providing emissions estimates for the categories N_2O from ethylene, CH_4 and N_2O from carbon black, dichloroethylene, styrene and methanol, CO_2 from ferroalloys, HFCs from the use of some products under consumption of halocarbons and SF_6, N_2O from wastewater handling and CH_4 from waste incineration, which are currently reported as not estimated ("NE"). The ERT recommends that, when reporting data on emissions for a given category for the first time, the Czech Republic ensures that data are provided for the entire time-series and that the methods, emission factors (EFs), activity data (AD) and other parameters is clearly explained in the NIR.

B. Institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

1. Overview

16.   During the in-country visit, the Czech Republic described the national system for the preparation of the inventory. The Ministry of the Environment (MoE) has overall responsibility for the national inventory and the Czech Hydrometeorological Institute (CHMI) performs the role of inventory agency. The preparation of the annual inventory is a shared exercise between CHMI and a number of other organizations and consultants. Koneko Marketing Ltd. (KONEKO) and the Transport Research Centre (CDV) are responsible for the energy sector inventory. The inventory for

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[4]   The SIAR, Parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paragraphs 5(a), 6(c) and 6(k)), under the auspices of the international transaction log (ITL) administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry. The SIAR is not publicly available.

industrial processes and solvent and other product use is compiled by CHMI and the Institute of Forest Ecosystem Research (IFER) prepares the inventory for agriculture and for LULUCF under both the Convention and the Kyoto Protocol. Waste sector emissions are the responsibility of the Charles University Environment Centre (CUEC). The overall management and reporting of the annual submissions is undertaken by CHMI. These arrangements have been in place for many years and there have been no changes in the situation for preparing the 2009 submission. While the national system fulfils the requirements for inventory planning, preparation and management, a general consolidation and strengthening of the national system using the established institutional arrangements that were required to fully comply with the annex to decision 19/CMP.1 is still not completed. This is currently manifested in a lack of coordination and direction on the part of CHMI in relation to QA/QC issues and the internal review of annual submissions as well as in insufficient collaboration between the compilers of the inventories for the energy, industrial processes and waste sectors.

17.   The ERT concluded that the national system continues to perform most of its required functions. However, there is scope for strengthening the system by allocating additional resources to enhance collaboration among the core institutions and establish an internal review process. In particular, the lack of an appropriate QA/QC plan for submissions up to 2009, which results in limited and uncoordinated QA/QC activities, has hampered the proper development of the Czech inventory submissions to date. In response to the ERT questions on this issue, the Czech Republic submitted a QA/QC plan on 1 December 2009, some aspects of which it plans to implement initially in completing its 2010 submission. The QA/QC plan addresses the general and specific QA/QC elements required by the annex to decision 19/CMP.1 and identifies the experts responsible for QA/QC activities in all IPCC sectors. The plan will be implemented under the direction and coordination of CHMI in the context of ISO 9001 quality standards for which CHMI is accredited. In its submission to the ERT, the Party indicated how the contracts between CHMI and the various institutions that prepare the inventory are modified to ensure that sector-specific QA/QC procedures are undertaken and recorded in the future. The ERT concluded that the QA/QC plan complies with the requirements of the annex to decision 19/CMP.1 on this issue and welcomes the proposal of the Czech Republic to begin immediate implementation of the plan.

2. Inventory planning

18.   When the contracts are placed with the inventory compilers annually, CHMI holds separate meetings with the individual institutions to plan the inventory according to the terms of reference of the contracts and to take account of the outcome of the UNFCCC review process. Issues such as a need for additional or new data, need for revised methods or other improvements are also covered but there is little indication that the inventory compilers identify or initiate improvements of their own volition. Uncertainty around the availability of resources under the contract scheme that underlies the national system hampers strategic and long-term inventory planning. CHMI, as the inventory agency, states that this reduces the effectiveness and reliability of the institutional, procedural and legal arrangements for estimating and timely reporting of GHG emissions. In practice, the fulfilment of their contracts is the primary objective of the institutions involved and this is achieved without the necessary collaboration among them and without the involvement of other relevant stakeholders that could influence the MoE as single national entity in making available additional resources for implementation of the national system. The ERT recommends that the MoE and CHMI continue to raise awareness of the importance of high-quality submissions to the UNFCCC and establish annual internal reviews of the completed inventory by important stakeholders not currently involved as a useful input to planning for the subsequent reporting cycle. The Czech Republic has already benefited from reporting its GHG emission inventory and becoming eligible to use the Kyoto Protocol mechanisms. The ERT encourages the MoE to allocate a portion of the funds being acquired from

international emissions trading to enhance and maintain the full functionality of the national system so that the Party may continue to benefit in this way.

3. Inventory preparation

Key categories

19.   The Czech Republic has reported a tier 1 key category analysis using both level and trend assessment as part of its 2009 submission. The Czech Republic has included the LULUCF sector in its key category analysis, which was performed in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The key category analysis for level assessment performed by the Party and that performed by the secretariat[5] produced the same results as the Party adopts the same broad categorization. The top five key categories in level assessment relate to CO_2 emissions and account for 80 per cent of emissions in 2007.

20.   The key category analysis continues to be treated mainly as a completeness issue in the annual submission of the Czech Republic and is not being used to prioritize inventory improvements in line with the IPCC good practice guidance. This is indicated by the use of tier 1 methods for many key categories in the 2007 inventory, even though higher tier methods could be applied. A finer granulation of the stationary combustion categories would also be useful in this regard. The ERT recommends that the Party take note of this situation and upgrade the estimation methodologies where appropriate for the combustion categories identified at the finer granulation level.

21.   The Czech Republic has not identified key categories for activities under Article 3, paragraph 3, and Article 3, paragraph 4, of the Kyoto Protocol. The Party believes this is not necessary and treats all the relevant activities (afforestation, deforestation and reforestation under Article 3, paragraph 3, and forest management under Article 3, paragraph 4) equally in methodological terms. The ERT encourages the Czech Republic to include this information in its next annual submission under 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 as provided in chapter 5.4.4 of the IPCC good practice guidance for LULUCF.

Uncertainties

22.   The uncertainty analysis continues to be treated mainly as a completeness issue in the annual submission of the Czech Republic and is not being used to prioritize inventory improvement in line with the IPCC good practice guidance. In this context, the ERT is of the view that the work being undertaken by Czech experts to elaborate expert judgement of uncertainty estimates provided in the IPCC good practice guidance is of limited use as the inventory lacks the required high-tier methods for the vast majority of emissions in key categories. The ERT recommends that the Party upgrade the methodologies in all such cases in the first instance, where appropriate, thereby providing a higher quality national inventory and the basis for an improved uncertainty assessment for the circumstances of the Czech Republic.

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[5]   The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance for LULUCF. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

Recalculations and time-series consistency

23.   Chapter 9 of the NIR describes recalculations that are part of the 2009 submission and there is a section on recalculations in the individual NIR chapters for the respective IPCC sectors. The major recalculations were reported in respect of the energy and LULUCF sectors. For energy, revised emissions were given for mobile sources for the years 2000–2006 to reflect updated fuel consumption data and calorific values and the use of EFs in the unit g/kg fuel rather than g/MJ. It remains unclear to the ERT why the work was limited to these years. In addition, revised estimates were reported for all stationary sources in 2006 to account for an improved energy balance. In LULUCF, revised estimates were reported for forest land, cropland, grassland, wetlands and settlements, accounting mainly for effects such as refined land-use identification and conversions to forest and revised biomass expansion factors. Revised emissions for lime production in all years are slightly increased as CO_2 recovery has not been taken into account.

24.   The recalculations have been performed and reported in accordance with the IPCC good practice guidance. The effect of the revisions on total emissions is insignificant, amounting to an increase of less than 1 per cent in all years. The ERT noted that the approach of the Party to recalculations appears to be rather ad hoc and does not adequately address inventory quality objectives and QA/QC outcomes, the availability of better AD or EFs, information from the analysis of key categories and uncertainties or the findings of annual reviews. The ERT recommends that the Czech Republic develop an inventory improvement programme linked to the QA/QC plan requested during the review to account for these factors in order to plan, implement and report recalculations in a more systematic, transparent and efficient manner.

Verification and quality assurance/quality control approaches

25.   Up to 2009, the Czech Republic had not prepared a QA/QC plan in accordance with the annex to decision 19/CMP.1 and the IPCC good practice guidance and had not complied with repeated requests to submit such a plan for review purposes. The lack of a plan that outlines quality objectives and QA/QC procedures for the composite inventory preparation system employed in the Czech Republic means that there was no reference against which the Party's limited information on QA/QC procedures could be reviewed and no basis upon which the Party could systematically manage and improve the quality of its GHG inventory. There are statements in the NIR about QA/QC for each IPCC sector, for which the individual bodies and consultants concerned are free to decide on the levels of QA/QC that they undertake individually under their contracts with CHMI. However, there is no documented minimum common standard that the responsible experts should follow, and it was confirmed during the review that invariably there are no records of QA/QC implementation by way of checklists, task schedules, error listings, sign-off or other documentation. In response to the ERT questions on this issue, the Czech Republic submitted a QA/QC plan on 1 December 2009, which it plans to implement initially in completing its 2010 submission.

Transparency

26.   The 2009 inventory submission is not fully transparent. Transparency can be improved substantially by providing tables of the AD and EFs to support the descriptions of methodologies for the emissions categories. The methodological descriptions need to be enhanced to make clear to the ERT how the data were applied to give the emissions values reported in the CRF tables. In particular, the inclusion of the energy balance would be very useful to the review of the energy sector, which accounts for the bulk of Czech emissions. Inadequate updating of the text in the NIR from year to year reduces transparency in cases where the description of a particular item may refer to the reporting year instead of the inventory year. The internal review procedure recommended by the ERT

could improve transparency by providing stakeholders with the opportunity to read and comment on the NIR before it is finalised.

4. Inventory management

27.   The Czech Republic does not yet have a centralized archiving system for GHG inventory input and output materials and supporting information. The inventory inputs and compilation data for the individual sectors are stored separately by the institutions and consultants responsible for delivering the inventory for their respective sectors. Under their contracts with CHMI, the inventory compilers are required to archive calculation sheets and other documents and materials used by the contractor to estimate the emissions, and must make all such information available on request to CHMI, in addition to the primary CRF tables and NIR deliverables.

28.   During the review the ERT visited the offices of CHMI to examine its archiving arrangements and provisions for data retrieval. The output CRF files and NIR components produced by the contributing institutions are archived at CHMI. The CHMI archive also includes calculation sheets and extensive supporting information and documentation used for the preparation of the inventory. However, the ERT noted that primary data input files, such as the applied energy balances, are not part of the CHMI archive. This is also the case for data from the European Union emissions trading system (EU ETS), which are under the control of the MoE. The ERT recommends that CHMI take responsibility for archiving all important inventory inputs, including an appropriate database of annual EU ETS data, so that all inventory information is available at a single location. In this way, the system under development by CHMI for improved record keeping and tracking of inventory data will have a wider application in identifying data elements that may be needed by ERTs in future reviews.

C. Follow-up to previous reviews

29.   The review of the 2009 submission of the Czech Republic finds that the recommendations in previous review reports relating to issues such as QA/QC, transparency, uncertainties and required improvements identified by the ERTs have not been fully implemented and that the status of the submission is broadly similar to that of 2008.[6] The most important issue was the Party's failure to include a QA/QC plan as part of its 2009 submission, as mentioned in paragraph 25, and failure to show how QA/QC procedures are undertaken by the inventory compilers for the individual sectors. Other previously identified issues that remain unresolved include the need for higher tier methods for key categories, for improved transparency generally and for more complete uncertainty assessment.

D. Areas for further improvement

1. Identified by the Party

30.   The 2009 NIR does not contain any description of improvements designed to substantially improve the quality of the submission from a general perspective. The Czech Republic has no inventory improvement plan and does not apply the UNFCCC inventory principles of transparency, comparability, consistency, completeness and accuracy to identify or carry out improvements in a strategic manner. Planned improvements mentioned in the sector chapters are limited to proposals to make better use of data sources in the energy sector, use more advanced methods in a few categories in industrial processes and apply QA/QC for agriculture, but these planned improvements still fail to recognize the broader issues highlighted in a number of recent reviews.

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[6] See documents FCCC/ARR/2008/CZE and FCCC/IRR/2007/CZE.

2. Identified by the expert review team

31.   The ERT identifies the following cross-cutting issues for improvement by the
Czech Republic:

(a)   The implementation of the QA/QC plan and an associated inventory improvement
        programme, beginning with the 2010 reporting cycle;

(b)   The improvement of transparency with regard to the use of AD supplied by the Czech
        Statistical Office (CSO), particularly for the energy sector and proper allocation of
        emissions between sectors;

(c)   The archiving of all inventory information, including all inventory data input and
        EU ETS databases, at CHMI and application of the data management and tracking
        system under development to cover all such information;

(d)   The use of tier 2 methods for key categories, where appropriate;

(e)   More complete assessment of uncertainty in the context of inventory improvement;

(f)   More systematic and strategic use of inventory principles as the basis for general
        inventory improvement.

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

III. Energy

A. Sector overview

33.   The energy sector is the main sector in the GHG emission inventory of the Czech Republic.
In 2007, emissions from the energy sector amounted to 123,330.48 Gg CO_2 eq, or 81.8 per cent of
total GHG emissions. Since 1990, emissions have decreased by 21.1 per cent. The key drivers for the
fall in emissions were the transition to a market economy and the substitution of natural gas for brown
coal in stationary combustion sources. Within the sector, 50.0 per cent of the emissions were from
energy industries, followed by 20.4 per cent from manufacturing industries and construction,
15.6 per cent from transport and 8.9 per cent from other sectors. Fugitive emissions accounted for
4.3 per cent and the remaining 0.9 per cent were reported under the category other (energy). Within
the sector 94.3 per cent of the emissions came from CO_2, 4.7 per cent from CH_4 and 1.0 per cent from
N_2O.

1. Completeness

34.   The CRF tables include emission estimates of most categories and gases in the energy sector,
as recommended by the Revised 1996 IPCC Guidelines. Categories reported as "NE" by the
Czech Republic in this annual submission include CO_2 emissions from mining and post-mining
activities, fugitive CO_2 emissions from oil production, emissions for all gases from the use of aviation
gasoline in international aviation and N_2O emissions from several fuels used in transport.
Furthermore, the Czech Republic has used the notation key not occurring ("NO") for other fuels in
subcategory 1.A.2(f), where fuel use does occur and emissions for all gases should have been
calculated. In addition fugitive emissions from 1.B.1(c) other solid fuels are reported as not available
("NA") while they are in fact "NE". The ERT recommends that the Czech Republic provide estimates
for those categories where fugitive emissions occur or otherwise use the notation key "NO".

35.   Following the recommendation of the previous review, the Czech Republic has calculated fugitive CH_4 emissions from the venting and flaring of oil and natural gas. The ERT commends the Czech Republic for this effort.

36.   Emissions from the energy sector have been reported for all years of the inventory time-series, and for the entire geographical area of the Czech Republic.

2. Transparency

37.   The Czech Republic provides almost no trend explanations in the NIR regarding the significant changes in emissions and energy use. The ERT recommends that the Czech Republic provides more trend explanations and improve their quality in its next annual submission.

38.   There are some inconsistencies in the use of notation keys, such as the use of "NA" instead of "NO" in several cells of CRF table 1.A(b) on the reference approach. The ERT recommends assessing the use of notation keys and making changes where appropriate.

39.   The NIR contains most of the EFs and net calorific values (NCVs) used in the inventory. However, the ERT reiterates the recommendations of the previous review to tabulate all EFs and NCVs in the NIR.

3. Recalculations and time-series consistency

40.   The ERT noted that recalculations reported by the Party of the years 2000 to 2006 have been undertaken to take into account a recalculation of the EFs of the individual defined categories of vehicles in road transportation and a more exact fuel input and NCV. Furthermore, recalculations have been undertaken in stationary combustion and transport because of the availability of more refined energy data. The recalculations amounted to a 0.08 per cent increase in the estimate of CO_2 emissions (92.52 Gg) in 2000 and a 0.38 per cent increase (432.06 Gg) in the 2006 estimate; a 0.19 per cent increase in the estimate of CH_4 emissions (11.78 Gg CO_2 eq) in 2000 and a 2.21 per cent increase (135.58 Gg CO_2 eq) in the 2006 estimate; and a 12.32 per cent decrease in the estimate of N_2O emissions (117.25 Gg CO_2 eq) in 2000 and a 3.94 per cent increase (43.99 Gg CO_2 eq) in the 2006 estimate. The rationale for these recalculations is provided in the NIR.

41.   The Czech Republic does not provide a full breakdown in subcategories under manufacturing industries and construction before 2003. For 2003–2005 a breakdown is provided based on different data sources compiled by KONEKO and from 2006 the breakdown is based on data from CSO. The consistency in time-series is poor and the ERT recommends the Czech Republic to recalculate the time-series using the AD time-series provided by CSO to the International Energy Agency (IEA).

42.   Emission estimates for transport have been compiled by CDV since 2000. For some of the subcategories the EFs have been changed, for example, the CO_2 EF for gasoline has been changed from the IPCC default to the default from the European Monitoring and Evaluation Programme (EMEP) database. However, this has not been done for all emission factors. The ERT recommends the Czech Republic to provide the rationale for the choice of EFs, and explain why the same factors have not been used for the entire time-series.

4. Uncertainties

43.   A tier 1 uncertainty analysis is applied for the energy sector mainly on the basis of IPCC default input uncertainties.

5. <u>Verification and quality assurance/quality control approaches</u>

44.   During the review the ERT noticed a lack of QA/QC activities in the compilation process. The AD are manually transferred from the CSO data set to the calculation sheet and during this transfer some adjustments are made, such as a correction for feedstock use in the ammonia (NH_3) industry. There is no check on the quality of either the data editing or the adjustments, according to the inventory compilers. The ERT noticed several discrepancies between the CSO data set and the data used for emission calculation; for example, the use of gas works gas that is in the original CSO data set but not in the calculation sheet, which could not be explained by the Party and may very well be due to editing errors. The ERT recommends that the Czech Republic increase the transparency of the compilation of the AD and introduce QC measures to avoid errors.

45.   The Czech Republic has no procedure for outlier detection for implied emission factors (IEFs) and AD and relies on the outlier detection from previous stages of the review. The ERT recommends that the Czech Republic complete its own outlier detection and correct data when necessary or provide explanations in the NIR for outliers when appropriate.

46.   During the review the ERT was notified of some ad hoc QC measures, which usually consist of an expert sending questions on AD to CSO to which the CSO does not necessarily provide the answers. The ERT recommends that the Czech Republic increase cooperation between the inventory compiler and CSO as part of efforts to improve the national system.

47.   The Czech Republic does not use EU ETS data in the energy sector even though plant-specific emissions, fuel consumption and EFs are available from this source. The Party explained that this is because the Czech inventory team does not have enough time to study the data and use them in the national inventory. The ERT recommends that the Czech Republic further develops its national system to facilitate use of EU ETS data, whenever this is in line with the IPCC good practice guidance, for verification purposes and as a source of EFs.

B. Reference and sectoral approaches

1. <u>Comparison of the reference approach with the sectoral approach and international statistics</u>

48.   The CO_2 emissions from fuel combustion were calculated using the sectoral approach and the reference approach. For the year 2007, there is a difference of 8.52 per cent. The NIR provides a detailed explanation of these differences, the main reason being the non-energy use and feedstock use of fuels. The ERT commends the Czech Republic on this comprehensive explanation and reiterates the recommendation of the previous ERT that the Party report the apparent energy consumption (excluding non-energy use and feedstock use) in table 1.A(c) to improve the transparency of the comparison.

49.   There are several differences between IEA energy data and the energy data reported in the CRF tables. For example, the total apparent energy consumption in the CRF tables differs from the IEA value by 0.2 per cent for 1990, while the value given in the CRF table for 2007 is 2.3 per cent lower than the IEA value. Since the CRF data are based on the same CSO data set as the IEA data, these discrepancies are unexpected. The Czech Republic explained that most of the differences are due to the use of different calorific values. The ERT encourages the Czech Republic to minimize the differences by using the same calorific values for both data sets.

2. International bunker fuels

50.   The Czech Republic reports no international marine bunkers, a fact which was also commented on by the previous ERT. During the review the Czech Republic agreed to estimate the fuel use for international navigation on rivers and report this in its next annual submission.

51.   Fuel for international aviation bunkers is estimated by subtracting the estimated amount used in domestic flights and military use from the total jet kerosene sales. The data show inter-annual fluctuations of more than 10.0 per cent for several years. The ERT reiterates the recommendation of the previous ERT that the Czech Republic provide explanations for these fluctuations.

3. Feedstocks and non-energy use of fuels

52.   The use of feedstocks and non-energy use of fuels is clearly identified in the NIR. The Czech Republic should be aware, however, that the carbon storage factors do not take into account the incineration of the products that are produced.

4. Country-specific issues

53.   The Czech Republic uses tier 1 approaches with default EFs for almost all key categories, and the emission estimation is therefore not in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance, which require higher tier approaches for key categories. The ERT reiterates the recommendation from previous ERTs to apply country-specific EFs. The available EU ETS data are a useful source of information for developing the higher tier methods in some cases.

C. Key categories

1. Stationary combustion: solid fuels – CO_2

54.   Emissions from solid fuels in stationary combustion (mainly brown coal) are calculated using country-specific EFs. The ERT commends the Czech Republic for including all EFs and calorific values in the NIR and so increasing transparency. However, the ERT recommends that the Czech Republic evaluate the value of the EFs since EU ETS data suggest that the country-specific EFs used in the inventory are too high and thus may lead to overestimates.

55.   Emissions from blast furnace gas are not reported in the energy sector, since they are included in the industrial processes sector. The ERT recommends that the Party move to a higher tier for the calculation of emissions from blast furnaces, not only to estimate emissions more accurately, but also to enable the Party to reallocate some of the emissions in the energy sector to improve transparency.

2. Stationary combustion: liquid fuels – CO_2

56.   Liquid fuel use in the refinery sector decreases by 24.3 per cent in 2007, while the use of all other fuels remains almost equal to that of 2006. Refinery feedstock decreases by a mere 4 per cent, while fuel use and refinery intake are correlated. The ERT recommends that the Czech Republic analyse the fuel use in the refinery sector using EU ETS data to ensure the quality of the AD.

57.   Emissions for ethylene production are calculated with the assumption, as in the reference approach, that 20.0 per cent of the feedstock is combusted (as waste gases). The ERT recommends that the Czech Republic provide a detailed description of this methodology in its next NIR, to assess whether the same methodology should be used for carbon black production and methanol production. The EU ETS data will be very useful in this assessment.

3. Road transportation: liquid fuels – CO$_2$ and N$_2$O

58.   Emissions of CO$_2$ from road transportation are calculated by CDV for the period 2000–2007. The EFs are EMEP default values. For the years 1990 to 1994, IPCC default EFs were used and a linear increase is applied between 1994 and 2000 to give the values for the intervening years. The ERT recommends using the same source of EFs for all years to develop a consistent CO$_2$ emissions time-series for this category in line with the IPCC good practice guidance.

59.   Emissions of N$_2$O from road transportation are calculated using a country-specific spreadsheet model, for which the EFs used are not well described. A study has been done to compare the country-specific model with the COPERT model. The results of this study show a significant difference (38.1 per cent) between the two approaches, with COPERT estimating lower emissions. The ERT recommends the Czech Republic to describe the source and manner of application of the N$_2$O EFs in the model used and include the time-series of the nationally-averaged EFs in the NIR.

D. Non-key categories

1. Stationary combustion: other fuels – all gases

60.   The Czech Republic does not report the use of other fuels. However, Internet sources and EU ETS reports provide information on significant use of alternative fuels in the cement industry. The ERT recommends that the Czech Republic include this fuel use and report the resulting emissions in its inventory. Furthermore, the Czech Republic uses waste incineration for energy purposes but all emissions are reported in the waste sector. The ERT recommends that the Party reallocate the emissions appropriately between the energy and the waste sectors.

2. Other transportation: gaseous fuels – CH$_4$

61.   The IEF for CH$_4$ from other transportation, that is, pipeline transport, ranges from 22.5 kg/TJ in 1990 to 0.16 kg/TJ in 2007. The source of the EFs used is unknown. Since the emissions originate from the fuel use in compressor stations, the ERT expects the EFs to be equivalent to industrial CH$_4$ EFs for natural gas use. The ERT recommends that the Czech Republic provide sufficient information on the EFs used or recalculate using the same EFs as in the industrial sectors.

3. Solid fuel transformation – CO$_2$ and CH$_4$

62.   Emissions of CH$_4$ are reported under industrial processes, iron and steel, and CO$_2$ emissions are reported under other energy industries, without explanation. Since CO$_2$ emissions for other energy industries are calculated solely from fuel consumption, the ERT assumes they are not included for this category. The ERT reiterates the recommendation from previous reviews that the Czech Republic provide a detailed explanation of how these emissions are treated.

E. Areas for further improvement

1. Identified by the Party

63.   The Czech Republic plans to improve cooperation with CSO, especially the section for energy statistics, and to obtain more exact data on the consumption and quality characteristics of fuels from the EU ETS database and from the national Register of Emissions and Sources of Air Pollution. There are also plans to investigate the use of intermediate products as fuels in the petrochemical industry and to use national specific uncertainty values to a greater degree.

<div align="center">2. <u>Identified by the expert review team</u></div>

64.   The ERT has identified several areas for further improvement in the energy sector. The most important issues are that the Czech Republic, in its next annual submission:

(a)   Implement QA/QC measures in accordance with the QA/QC plan;

(b)   Recalculate the time-series for stationary combustion using CSO data to ensure complete time-series consistency;

(c)   Upgrade the methodologies for key categories to a higher tier using EU ETS data where appropriate and other information sources, in line with IPCC good practice guidance;

(d)   Provide more background documentation on AD, EFs and methodologies used in the NIR.

IV. Industrial processes and solvent and other product use

A. Sector overview

65.   In 2007, emissions from the industrial processes sector amounted to 15,593.00 Gg CO_2 eq, or 10.3 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 512.17 Gg CO_2 eq, or 0.3 per cent of total GHG emissions. Since 1990, GHG emissions have decreased by 20.4 per cent in the industrial processes sector, and by 33.0 per cent in solvent and other product use. Emissions of fluorinated gases (F-gases) increased by 2,137.3 per cent between 1995 and 2007 since there was almost no consumption of HFCs and PFCs in 1995. The key drivers for the fall in emissions in the industrial processes sector are reduced production of iron and steel and ammonia and improved technology in the production of nitric acid. Within the industrial processes sector, 51.9 per cent of the emissions were from metal production, followed by 28.0 per cent from mineral products and 10.9 per cent from consumption of halocarbons and SF_6. The remaining 9.1 per cent were from chemical industry.

<div align="center">1. <u>Completeness</u></div>

66.   The CRF tables include estimates of most gases and categories of emissions from the industrial processes and solvent and other product use sectors. Categories and gases reported as "NE" by the Czech Republic in this annual submission include asphalt roofing, road paving with asphalt, carbon black, N_2O from ethylene, dichloroethylene, styrene, methanol and production of ferroalloys. The ERT encourages the Party to estimate these emissions where IPCC methods are available and in addition to estimate and include emissions of F-gases from products (including imported and exported HFCs in domestic refrigeration, small refrigerating equipment, heating pumps, cars) in the next annual submission. The Party should also complete CRF table 9 and to use notation keys in line with the UNFCCC reporting guidelines.

<div align="center">2. <u>Transparency</u></div>

67.   The NIR does not include explanations or a discussion of emission trends in the chapter on industrial processes or elsewhere in the NIR. The ERT recommends that the Czech Republic include the discussion of trends in the NIR, particularly for key categories.

68.   The methodologies, AD and EFs used are not always described in a transparent manner in the NIR. Although the structure of the industrial processes chapter in the NIR follows the UNFCCC reporting guidelines, the NIR is difficult to follow and it is difficult to reconcile activity data in the

CRF tables with descriptions of data given in the NIR. It should be specified, for example, which AD are reported for metal production. The ERT recommends that the Czech Republic increase the transparency of the industrial processes reporting by ensuring that each category is described under the headings of trends, method, AD, EF, uncertainties, category-specific QA/QC, recalculation and planned improvements.

69.   During the review, the Czech Republic provided responses to several questions from the ERT. The ERT recommends that the Czech Republic use this information to improve the transparency of the NIR and the CRF tables in its next annual submission.

3. Recalculations and time-series consistency

70.   Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party of the time-series 1990 to 2006 have been undertaken for CO_2 from lime production because previous estimates incorrectly accounted for CO_2 recovery in lime use. The recalculation has been recommended in several previous review reports, and the methodology used is in line with the IPCC good practice guidance. The recalculations have increased the estimates of CO_2 emissions from lime production in all years 1990–2006, resulting in increases in total national GHG emissions, which range from of 0.24 per cent in 1990 to 0.18 per cent in 2006.

4. Uncertainties

71.   Uncertainty estimates for AD and EFs reported in the NIR are based on expert judgement. In the NIR and during the review it was explained that category-specific uncertainty estimates will be improved. The ERT encourages the Czech Republic to use the results from the improved uncertainty estimates to prioritize future improvement of emission estimates for industrial processes. The ERT recommends that the Czech Republic report the result of this work in the next NIR.

5. Verification and quality assurance/quality control approaches

72.   The AD and EFs from EU ETS data have, to some extent, been used for comparison with calculated data reported in CRF tables. There is significant potential for using more data reported within the EU ETS both for comparison with calculated emissions and also to use the reported emissions from EU ETS more directly into the inventory, whenever this is in line with the IPCC good practice guidance. The ERT felt that this is an opportunity to improve the quality of the national emissions inventory. The ERT therefore encourages the Czech Republic to use EU ETS data, whenever this is in line with the IPCC good practice guidance, as a means to include verified data in the inventory compilation for key categories in this sector.

B. Key categories

1. Iron and steel production – CO_2

73.   The emissions from iron and steel production are estimated using the tier 1 method based on coke consumption in blast furnaces. The use of the tier 1 method raises an issue of allocation of emissions between the energy and industrial processes sectors, and using a tier 2 method would improve the accuracy of the allocation of emissions between these sectors. The NIR states that there is a plan to use a tier 2 method in the future. The ERT recommends that the Czech Republic implement this plan. The ERT reiterates the recommendation from the previous review that the Czech Republic reports the number of plants and describes the prevailing technologies to support the understanding of the method used.

2. Cement production– CO$_2$

74.　During the review the Party explained that data on CO$_2$ emissions from clinker production given in the EU ETS report were combined with production data for clinker available from the Czech Cement Association (CCA) to develop a country-specific EF. This country-specific EF is used to estimate total CO$_2$ emissions from clinker production. The ERT recommends that the Czech Republic describe its method for calculating CO$_2$ emissions from clinker production in the NIR and clarify whether an EF from EU ETS data is applied for the years before the EU ETS was established.

75.　Since the figure for CO$_2$ emissions included in the inventory seems to be consistent with EU ETS data, the ERT recommends that the Party clarify if and how cement kiln dust, by-pass dust and emissions from non-carbonated carbon is reflected in the emissions reported in the EU ETS. The ERT also recommends that the Czech Republic clarify how the EU ETS data are used for other historical years of the time-series.

3. Lime production – CO$_2$

76.　The Czech Republic reported the emissions from lime production and removals from the atmosphere during lime use in previous submissions. Based on recommendations in earlier reviews the emissions are recalculated and the emission estimates no longer include the removal of carbon during lime use. The ERT noted that the revised approach is in line with IPCC methodology.

4. Nitric acid production – N$_2$O

77.　Emissions from nitric acid production are estimated based on country-specific EFs that are derived from in-situ measurements. The AD are based on questionnaire responses from producers. The description of methods and EFs could be more transparent and the ERT reiterates the recommendation of the previous review that the Czech Republic report more precisely when the abatement technologies have been operational each year, as this has a significant impact on emissions. The ERT also recommends that the Czech Republic improve the description of the sector in its NIR to justify the use of the factors selected for the technologies in place. This will allow the ERT to compare measured EFs with EFs from literature sources and from other Parties.

5. Other applications using ODS substitutes – HFCs and PFCs

78.　Both actual and potential emissions are reported for this category. The data are collected based on voluntary cooperation between sectoral experts and companies. The import and export statistics are based on individual chemicals and do not include F-gases imported in products. All emissions from stationary refrigeration are reported under domestic refrigeration. The ERT reiterates the recommendations from the previous review that the Czech Republic disaggregate the emissions from stationary refrigeration into the relevant subcategories and account for the imports and exports of ozone-depleting substance (ODS) substitutes in products. Greater detail regarding the methods, EFs and AD for individual substances is needed to improve the transparency of the inventory.

79.　Emissions from this category prior to 1995 are reported as "NO" and/or "NA". The ERT encourages the Czech Republic to clarify whether the use of these substances only began in 1995 or whether the emissions have not been estimated for the years prior to this date. The ERT recommends the Party to estimate and report any such relevant emissions.

80.　The ERT was informed during the review that an inventory of F-gases in products is being prepared and the first results from the survey have already been published and will be included in the next annual submission.

C. Non-key categories

Solvent and other product use – N_2O

81.   The use of N_2O in the food industry and health care is reported under this category. The emissions are estimated to be constant for the entire time-series. The same value of emissions is reported for N_2O use in anaesthesia and for N_2O from aerosol cans. During earlier reviews, the Czech Republic has clarified that N_2O for use in anaesthesia and for aerosol cans is produced in a single plant in the country. Official production data are not available and, in the inventory, a rough estimate based on external expert judgement is used to estimate emissions. The ERT reiterates the encouragement from the previous review that the Party include this explanation in the next NIR in order to increase transparency.

82.   The results of QA/QC for this category have led to the conclusion that minor corrections of solvent use data from 1990 are needed. The ERT recommends that the Czech Republic include these corrections in its next annual submission.

D. Areas for further improvement

1. Identified by the Party

83.   The Czech Republic plans to implement a tier 2 methodology for iron and steel, to obtain data for lifetime for refrigeration and air-conditioning equipment for HFCs emission calculation, to include emissions of F-gases from products and to correct emissions from solvents.

2. Identified by the expert review team

84.   The ERT has identified several areas for further improvement. The most important issue is that the Czech Republic estimate emissions of CH_4 and N_2O from carbon black, dichloroethylene, styrene, methanol, as well as emissions of CO_2 from ferroalloys, where methods are available, and include them in its next annual submission.

V. Agriculture

A. Sector overview

85.   In 2007, emissions from the agriculture sector amounted to 7,837.74 Gg CO_2 eq, or 5.2 per cent of total GHG emissions. Since 1990, emissions have decreased by 49.3 per cent. The key driver for the fall in emissions is a decrease in the animal population, mainly cattle. Within the sector, 59.0 per cent of the emissions were from agricultural soils, followed by 30.3 per cent from enteric fermentation and 10.7 per cent from manure management.

1. Completeness

86.   The CRF tables include estimates of all gases and categories of emissions from agriculture as recommended by the Revised 1996 IPCC Guidelines. Emissions from agriculture have been reported for all years of the inventory time-series, and for the entire geographical area of the Czech Republic.

2. Transparency

87.   The information contained in the NIR is not detailed enough to enable reviewers to fully assess underlying assumptions and rationale for choices of data, methods and other inventory parameters. The ERT reiterates the recommendation from previous reviews that more information on major assumptions, data collection, expert consultations and parameters need to be included in the

NIR. More descriptions are particularly needed in the sections on enteric fermentation from cattle and direct emissions from agricultural soils.

3. Recalculations and time-series consistency

88.   Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party for 2005 and 2006 have been undertaken only to correct average gross energy intake for non-dairy cattle (enteric fermentation). The changes have a very minor effect on the estimate of total GHG emissions in the sector (0.02 per cent in both years).

4. Uncertainties

89.   A tier 1 uncertainty analysis is available in tabular format in the NIR, but no specific information about the sources of uncertainty estimates for AD and EFs is presented for the sector.

5. Verification and quality assurance/quality control approaches

90.   A detailed QA/QC plan is under development, but according to the NIR some sector-specific QC procedures have been performed in order to check AD and EFs. Given the number of errors in the 2009 submission detected during the review, which includes errors in the calculation spreadsheets for crop residue, errors in CRF tables (emission estimates for indirect emissions and additional information, tables 4.A, 4.B(a) and 4.D) and some discrepancies between the NIR, CRF tables and calculation tables, the ERT concludes that the implementation of QA/QC procedures is not adequate.

B. Key categories

1. Direct emissions from agricultural soils – N_2O

91.   The Czech Republic uses the tier 1 method as described in the Revised 1996 IPCC Guidelines, along with default values for fractions and the IPCC default EF of 0.0125 kg N_2O-N/kg N for all subcategories.

92.   The amount of nitrogen (N) excreted from animal waste management systems (AWMS), after discounting the N volatilized as NH_3 and nitrogen oxides ($Frac_{GASM} = 0.2$) does not match the value reported for N from animal manures applied to soils (CRF table 4.D). The reason for this is the use of the 1996 IPCC methodology rather than the updated approach provided in the IPCC good practice guidance. The ERT recommends that the Czech Republic apply the methodology from the IPCC good practice guidance in its next annual submission.

93.   The emissions from crop residues are too low when compared with the available data on crop production. In the calculation of N_2O emissions, the default value for $Frac_{BURN}$ of 0.1 has been used, even though burning of crop residues does not occur in the Czech Republic. Because of the error detected in the calculation spreadsheets, the residues from pulses have not been included in the calculations. The amount of crops has been transformed to the dry matter using the default $Frac_{DM}$ of 0.85. The same fractional parameter has been used also for N-fixing crops. This is in line with the Revised 1996 IPCC Guidelines but, according to the IPCC good practice guidance, the crops $Frac_{DM}$ should not be applied if a simple tier 1 (tier 1a) method is used. The ERT recommends that the Czech Republic correct errors in the calculation and use correct fractional parameters which correspond to the national circumstances and which are also in line with the IPCC good practice guidance in its next annual submission.

94.   For calculations of emissions from crop residues, only cereals and pulses have been included and for calculations of emissions from N-fixing crops, only pulses have been included. The ERT

recommends that the Czech Republic include other relevant crops or at least soya beans in the calculation in its next annual submission.

95.   In the 2009 submission, fractional parameters were reported for the whole period 1990–2007; $Frac_{NCRO}$ was reported as 0.03 kg N/kg dm, $Frac_{NCRBF}$ as 0.015 kg N/kg dm and $Frac_R$ as 0.15 kg N/kg crop-N, which all differ from the IPCC defaults (0.015, 0.3 and 0.45, respectively). The ERT noted that the $Frac_{GRAZ}$ value is kept constant throughout the period 1990–2007, although the amount of manure from grazing animals decreased drastically in that time. The ERT reiterates the recommendations from previous reviews that the Czech Republic revise the values reported in the CRF tables for $Frac_{NCRO}$, $Frac_{NCRBF}$, $Frac_R$ and $Frac_{GRAZ}$ for all years in its next annual submission.

96.   The EF for nitrogen symbiotic fixation, which was erroneously reported in the 2002 inventory, was corrected in the 2009 submission.

97.   During the in-country review, the Party confirmed that there are no cultivated histosols on agricultural land in the country.

2. Indirect emissions from agricultural soils – N_2O

98.   The Czech Republic uses the tier 1 method as described in the Revised 1996 IPCC Guidelines, default values for fractions and the IPCC default EF of 0.0125 kg N2O-N/kg N for all the subcategories.

99.   The AD and N_2O emissions from N from fertilizers and animal manure that are lost through leaching and run-off were erroneously reported for 1997, 2003 and 2006. The same is true for volatized N from fertilizers and animal manure for 1997 and 2006. The ERT recommends that the Czech Republic correct this issue in its next annual submission.

3. Enteric fermentation – CH_4

100.   Methane emissions were estimated using a tier 2 method for cattle and the tier 1 method, as well as 1996 IPCC default values, for other livestock, which is in line with the IPCC good practice guidance.

101.   The milk yield per cow per day calculated from CSO data slightly differs from that reported in the CRF tables and in the NIR for 2003–2007. During the in-country review, the Party provided an explanation of sources of data on milk yield. The ERT recommends that the Czech Republic include more explanation of milk yield data and correct the erroneous values in its next NIR.

4. Manure management – CH_4

102.   The Czech Republic applied the IPCC tier 1 method for this category, although it is a key category by trend. This methodological approach is not in line with the IPCC good practice guidance and the ERT reiterates the recommendation from the previous review that the Czech Republic estimate emissions from cattle using a higher tier in its next annual submission.

C. Non-key categories

Manure management – N_2O

103.   Emissions are estimated using the tier 1 method from the Revised 1996 IPCC Guidelines and default values from table 4-21 for allocation of manure per AWMS for all animal categories. According to the IPCC good practice guidance, if country-specific manure management system usage data are "NA", the appropriate default values for dairy cattle, non-dairy cattle, buffalo, and swine should be taken from tables B-3 to B-6 of appendix B of section 4.2 of the chapter on agriculture of

the reference manual. The IPCC default values for all other animal species and categories should be taken from table 4-21 of the same chapter. As country-specific data on pasture for dairy cattle are available for 1990–2007, the Party is encouraged to obtain country-specific data for the allocation of manure, at least for cattle, to improve the accuracy and allocation of N_2O emissions.

D. Areas for further improvement

1. Identified by the Party

104.   The Czech Republic plans to implement the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) as the methodological basis for the agriculture inventory. The Party also intends to implement QA/QC procedures for the agriculture sector in accordance with its general QA/QC plan and to present the results from the new uncertainty analysis. The ERT reminded the Czech Republic that the 2006 IPCC Guidelines have not yet been adopted by the Conference of the Parties and that the UNFCCC reporting guidelines require the GHG emissions inventories to be in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

2. Identified by the expert review team

105.   The ERT has identified several areas for further improvement. The most important recommendations are that the Czech Republic implement QA/QC procedures at all stages of inventory preparation and apply the IPCC good practice guidance with regard to N_2O emissions from manure management and direct N_2O emissions from agricultural soils. The Czech Republic should include more complete and specific data in its NIR on these issues.

VI. Land use, land-use change and forestry

A. Sector overview

106.   In 2007, net removals from the LULUCF sector amounted to 1,719.88 Gg CO_2 eq, which offset total GHG emissions by 1.1 per cent. Since the base year net removals have decreased by 62.3 per cent. In 2007, the bulk of CO_2 removals occurred in forest land remaining forest land (1,347.31 Gg CO_2 eq), with some contributions from land converted to forest land (427.72 Gg CO_2 eq) and land converted to grassland (387.29 Gg CO_2 eq. Cropland (both cropland remaining cropland and land converted to cropland) is a source of CO_2 emissions, as is grassland remaining grassland, land converted to wetlands, and land converted to settlements.

1. Completeness

107.   The CRF tables include estimates of most gases and categories of emissions and removals from the LULUCF sector. Emissions from the LULUCF sector have been reported for all years of the inventory time-series, and for the full geographical area. Where available, the changes in carbon stocks in living biomass were provided in full. However, the 2009 submission did not include estimates of changes in carbon stocks in dead organic matter (DOM) in all land-use categories. For soils, some estimates of carbon stock changes were reported. The Party also reported estimates of N_2O emissions from disturbance associated with land-use conversion to cropland, CO_2 emissions from agricultural lime application and CO_2 emissions from biomass burning in forest land remaining forest land.

2. Transparency

108.   The Czech Republic has a total land area of 7,886.7 kha. For consistent representation of land, the annually updated areas from the Czech Office for Surveying, Mapping and Cadastre

(COSMC) were used, linking the database land-use definitions to IPCC land-use categories. The method used has the attributes of both approach 2 and approach 3 of the IPCC good practice guidance for LULUCF. In the 2009 submission, about 41.5 per cent of the country's total area was classified as cropland, 33.6 per cent as forest land, 13.0 per cent as grassland and the remaining 8.5 per cent, 2.1 per cent and 1.4 per cent as settlements, wetlands and other land, respectively.

109. The methodologies that the Czech Republic has used to estimate changes in carbon stocks and emissions of non-CO_2 gases in the LULUCF sector are consistent with the IPCC good practice guidance for LULUCF. For the changes in carbon stock in living biomass, the Czech Republic used a tier 2 or tier 3 approach, whereby country-specific biomass conversion and expansion factors were applied to estimate increments and losses. For DOM, a tier 1 method was applied which assumes that there was no carbon stock change in the pool. It was also assumed that no changes in carbon stock (tier 1) occurred in soils.

3. Recalculations and time-series consistency

110. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The recalculations are reported for CO_2 in land categories 5.A through 5.F for all years and for CH_4 and N_2O in category 5.A in all years. The major change is in 5.A Forest Land where they reflect refinement to land-use identification and the use of revised age-dependent biomass expansion factors and conversion factors. In other land-use categories the recalculations account for refinement using the IPCC good practice guidance for LULUCF and whenever feasible the methodological elements of the 2006 IPCC Guidelines. The revised estimates show annual CO_2 removals increased by between 6 and 31 percent and total emissions including LULUCF decreased in the range approximately 0.3 to 0.9 percent. Methodologies are consistent across the 1990–2007 time-series.

4. Uncertainties

111. Results of the uncertainty analysis on LULUCF categories were included in the NIR. However, combining uncertainties for the LULUCF sector based on uncertainties of individual categories within this sector was found to be problematic since very high values were obtained.

5. Verification and quality assurance/quality control approaches

112. The NIR states that QA/QC procedures generally cover the elements listed in the IPCC good practice guidance for LULUCF but it does not elaborate on how such procedures are conducted or recorded.

B. Key categories

1. Forest land remaining forest land – CO_2

113. For this category, the Czech Republic reported changes in carbon stock in living biomass and non-CO_2 emissions from biomass burning. The IPCC default method (gain–loss method) was used to estimate changes in carbon stocks in living biomass. Country-specific biomass conversion and expansion factors were used for increment and harvest (losses). The IEFs for living biomass "gains and losses" were found to be consistent with countries of similar environment.

114. The change in carbon in DOM is assumed to be "zero" or no change (tier 1) since according to the NIR "the country did not experience significant changes in forest types, disturbance or management regimes within the reporting period". However, the ERT considers that, given the forest activities (management and harvesting) occurring in the forests of the Czech Republic, changes in carbon stock in DOM should be estimated. As good practice, and since this is a key category, the

Czech Republic is encouraged to use higher tiers, following the example of other reporting Parties with similar forest environments.

115.   In its 2009 submission, the Czech Republic has assumed that there have been no changes in carbon stocks in either mineral or organic soils. As good practice (for completeness) and since this is a key category, the Czech Republic is encouraged to report changes in carbon stock in soils (at least in mineral soils) using higher tiers and to report the estimates in its next annual submission.

116.   The Czech Republic reported on the uncertainties associated with the use of data on land-use categories, biomass conversion and expansion factors, harvest or losses, carbon fraction, and root–shoot ratio. The ERT appreciates this progress made by the Czech Republic as a move to improve its LULUCF reporting. The ERT recommends that the Czech Republic continue its efforts in performing uncertainty analysis as new and improved data become available for use in the LULUCF part of the inventory.

2. Cropland remaining cropland – CO_2

117.   Based on trend assessment, the Czech Republic reported CO_2 emissions (more carbon losses than carbon gains) from cropland remaining cropland in living biomass and soils as a key category. This finding may be due to increased CO_2 emissions caused by changes in perennial woody crops in croplands which include vineyards and orchards. The contribution of this category, however, was small compared with CO_2 emissions that occurred in land converted to cropland and land converted to settlements. The ERT encourages the Czech Republic to further evaluate this category and its status as a key category.

C. Non-key categories

1. Land converted to forest land – CO_2

118.   The Czech Republic assumed that the loss in carbon stock in living biomass in this category is insignificant (zero) because the first significant thinning (when there are more carbon losses) occurred only in older classes, which is implicitly accounted for within the category forest land remaining forest land. In reporting "losses" in carbon stock for land converted to forest land in CRF table 5.A, the Czech Republic used the notation "NA". The ERT considers, however, based on the NIR statement, that it is more appropriate to use included elsewhere. The ERT recommends that the Czech Republic apply this notation key in its next annual submission.

119.   The Czech Republic did not report net carbon stock changes in DOM in lands converted to forest land in its 2009 submission. Considering the accumulation of biomass (and carbon) due to forest growth, and as good practice (completeness of reporting carbon pools), the ERT encourages the Czech Republic to report changes in carbon stocks in this pool and land-use subcategories.

2. Emissions from agricultural lime application – CO_2

120.   The ERT observed some problems with the time-series consistency of CO_2 emissions from liming, particularly for the early part of the 1990s: In 1991, the estimate of CO_2 emissions from this category abruptly declined by 73.0 per cent on the 1990 level, in 1992, the estimate was 91 per cent lower than in 1990. Between 1992 and 2007, CO_2 emissions from liming appeared to be constant. The ERT believes that a further review of the AD used to estimate CO_2 emissions from lime application should be made. However, if the Czech Republic found in its review that this is really the case, to improve transparency in its future submission the ERT recommends that the Czech Republic provide the necessary data (or the related publication source) to support the explanation given in the NIR for this abrupt change in lime application and the corresponding CO_2 emissions.

D. Areas for further improvement

1. Identified by the Party

121.   For the next annual submission, the Czech Republic intends to improve its LULUCF reporting by increasing the transparency of the NIR (particularly on basic assumptions) and by revisiting the uncertainty analysis using new information sources.

2. Identified by the expert review team

122.   The Czech Republic may wish to aim to improve estimates of GHG emissions and removals in the LULUCF sector by using higher tier methods for DOM and soil carbon pools instead of using IPCC default methods and EFs.

VII. Waste

A. Sector overview

123.   In 2007, emissions from the waste sector amounted to 3,549.92 Gg CO_2 eq, or 2.4 per cent of total GHG emissions. Since 1990, emissions have increased by 34.0 per cent. The key driver for the rise in emissions is CH_4 from solid waste disposal on land (SWDL). Within the sector, 68.1 per cent of the emissions were from SWDL, followed by 20.2 per cent from wastewater handling and 11.8 per cent from waste incineration. Waste is the only sector that shows an increasing trend in emissions. CH_4 emission from solid waste disposal on land is a key category by level and trend while CO_2 from waste incineration is a key category by trend.

1. Completeness

124.   The CRF tables include estimates of all gases and categories of emissions from the waste sector, as recommended by the Revised 1996 IPCC Guidelines. Emissions of CH_4 from waste incineration are reported as "NE" as they are considered negligible and the Czech Republic. During the in-country review, the ERT was informed that, despite the small amount, the Czech Republic plans to include CH_4 in a recalculation using default parameters from the 2006 IPCC Guidelines. Emissions from the waste sector have been reported for all years of the inventory time-series except for CO_2 from waste incineration in 1990.

2. Transparency

125.   The Czech Republic has provided some information on the methodologies used. The ERT found that the explanation in the NIR is limited with regard to the overlaps between the waste and energy sectors, such as gas recovery for energy purposes in solid waste disposal sites (SWDS) and energy use from waste incineration. The ERT recommends that the Czech Republic clearly explain how emissions are allocated for these overlaps between the sectors. Definitions of waste utilization and disposal are needed to clarify the waste flow in the Czech Republic and must be clearly described in the NIR. The ERT encourages the Czech Republic to provide, in the next annual submission, a flow diagram of waste utilization and disposal to provide a better understanding of waste management in the country. Several typographical errors that were identified by the previous ERT have not yet been corrected. The ERT recommends that the Czech Republic strengthen internal QA/QC procedures to eliminate these mistakes in the next annual submission.

3. Recalculations and time-series consistency

126.   No recalculations have been made for waste in the 2009 submission.

4. Uncertainties

127.   No quantitative uncertainty estimates were provided for any subcategory in the waste sector. Due to the limitations of the country-specific data used and poor knowledge of the uncertainty in AD given in the Czech Statistical Environmental Yearbook, estimation of uncertainty in most categories is not undertaken. The ERT recommends that the Czech Republic quantify the uncertainty in each category in the waste sector order to complete and improve the overall uncertainty estimates for the inventory. During the in-country review, the ERT was informed that an uncertainty analysis will be undertaken using statistical tools such as Monte-Carlo and Matlab, with the aim of covering the whole sector by 2011. The ERT looks forward to the outcome of the planned uncertainty analysis in the near future.

5. Verification and quality assurance/quality control approaches

128.   Most of the activity data are taken from CSO. Some basic QC practices were applied. During the in-country review, the ERT found that QA is based on the academic activities of experts, reflecting the lack of a general QA/QC plan. The ERT recommends that internal checking of essential changes is carried out before submission, in accordance with previous review recommendations.

B. Key categories

1. Solid waste disposal on land– CH_4

129.   Emissions of CH_4 from SWDL contribute 68.1 per cent of sectoral emissions and are identified as a key category in both the level and trend assessments. Emissions in 2007 were 45.4 per cent higher than in the base year.

130.   The Czech Republic used the tier 2 first-order decay methodology provided by the 2006 IPCC Guidelines with a default value for waste composition according to climate zone definition and assumed this composition to be stable over time. The ERT recommends that the Czech Republic acquire country-specific data on waste composition in a timely manner, as this parameter is important for the accuracy of estimation. In fact, waste composition is dynamic and varies over time. Therefore, the ERT noted that using default values with stable composition is not appropriate and cannot improve the uncertainty in estimating emission from SWDS. The issue has already been identified by two previous reviews. During the in-country review, the ERT was informed of plans to obtain waste composition data in 2010.

131.   During the in-country visit, the ERT was informed that estimation of CH_4 emissions was based on the report of the Statistical Environmental Yearbook of the Czech Republic under the category "D1 Disposition under ground (landfilling)". Therefore, the estimate for the rate of waste generation in the CRF tables fluctuates due to the variation in the share of waste collected. The ERT recommends that the Czech Republic use the actual data on landfills to estimate CH_4 emissions from solid waste at a disaggregated level to improve accuracy.

132.   The ERT took note of a Czech study that includes a sensitivity analysis of the key factors affecting emissions from solid waste disposal and welcomes the comparison study of SWDS using waste composition data from other countries with similar economies and/or international drivers.

2. Waste incineration – CO_2 and N_2O

133.   Emissions of CO_2 from waste incineration are a key category by trend. The Czech Republic used the tier 1 method, applying the default value from the Revised 1996 IPCC Guidelines. The AD used were taken from the Statistical Environmental Yearbook according to the waste categories provided. The ERT was informed that the volumes of waste disposal by incineration and waste used

to produce energy have been determined following national definitions of waste categories. The ERT recommends that the Czech Republic provide a clearer explanation regarding the allocation of emissions between the waste and energy sectors in the next NIR and to improve the information on clinical and hazardous wastes that contribute to emissions.

134.   The IPCC default values are used for the fraction of fossil carbon in all wastes incinerated, including hazardous waste and clinical waste. The ERT encourages the Party to assess the actual fossil carbon fraction in all waste types and apply a representative country-specific value in the estimation to increase accuracy.

135.   As already pointed out in previous reviews, CO_2 emissions from waste incineration were not estimated for the year 1990. During the in-country review, the ERT was informed that, due to the acquisition of actual data of waste incineration, the CO_2 emissions for 1990 will be reported in the next annual submission.

136.   The ERT noted that CH_4 emissions from incineration were reported as "NE". However, the ERT was informed that the Czech Republic has now taken this issue into account and plans to include estimates using the EF provided in the 2006 IPCC Guidelines.

C. Non-key categories

Wastewater handling – CH_4

137.   The ERT noted that the methodologies used for estimating CH_4 from wastewater handling were in line with the Revised 1996 IPCC Guidelines, with mostly default values applied. The industrial types specified in the NIR are not consistent with the CRF tables. Incomplete data on industrial types were found in the CRF tables. The Czech Republic used a default value from the average range as presented in the 2006 IPCC Guidelines to estimate CH_4 from industrial wastewater treatment. The ERT encourages the Czech Republic to assess the chemical oxidation demand value from measurement data of industrial wastewater in order to improve its accuracy and uncertainty for CH_4 emissions.

D. Areas for further improvement

1. Identified by the Party

138.   The ERT notes the Party's acceptance of previous review findings to estimate emissions from composting using parameters from the 2006 IPCC Guidelines and to be complete in the next annual submission.

2. Identified by the expert review team

139.   The ERT reiterates the need to improve accuracy and reduce uncertainty in the waste inventory by using country-specific data, particularly for SWDL. The ERT welcomes improvement plans related to waste composition and other essential parameters and recommends that this plan be implemented in a timely manner. The ERT recommends the Czech Republic to strengthen the QA/QC plan systematically and routinely for the inventories from 2008 onwards. The ERT recommends using additional diagrams of solid waste and wastewater flows in the NIR to clarify the technical terms and increase transparency. The ERT encourages the Czech Republic to make landfill data a priority and conduct analysis at a more disaggregated level for accuracy purposes.

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

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

140.   The Czech Republic submitted on a voluntary basis, its emissions and removal estimates arising from LULUCF activities under Article 3, paragraph 3, and forest management under Article 3, paragraph 4, of the Kyoto Protocol. This submission uses actual AD for the 2003–2007 period to mimic reporting and accounting for the five-year commitment period of the Kyoto Protocol. The methodology is based on the IPCC good practice guidance for LULUCF and is linked, as much as possible, to the system for detecting land-use change and to the emission inventory prepared under the Convention. The land-use change identification and analytical system is based on annually reported data on land use in almost 13,000 cadastral units in the country.

141.   The methodologies used for LULUCF reporting under the Kyoto Protocol, as described in Part II of the NIR, are generally the same methodologies described in the NIR chapter on LULUCF reporting under the Convention. These methodologies are consistent with the IPCC good practice guidance for LULUCF; although in some cases the use of higher tier methods is recommended by the ERT.

142.   The areas subjected to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, were reported, however the geographical location ("identification code") corresponding to each area or subdivision was not supplied. The ERT recommends that the Czech Republic provide the "identification code" for these areas in its next annual submission.

143.   The Czech Republic has reported information on most of the categories of anthropogenic GHG emissions by source and removals by sink resulting from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. However, the ERT suggests as good practice that the Party include the reporting of changes in carbon stock in DOM and soils in its next annual submission.

144.   In its 2009 submission, the Czech Republic did not factor out the indirect and natural GHG emissions and removals. In addition, the Party did not report information that demonstrates that activities under Article 3, paragraph 3, of the Kyoto Protocol began since 1990 and that they are directly human-induced nor information on how harvesting or forest disturbance that is followed by the re-establishment of a forest is distinguished from deforestation. The ERT recommends that the Czech Republic provide this information in its next annual submission.

B. Information on Kyoto Protocol units

1. Standard electronic format and reports from the national registry

145.   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 SIAR on the SEF tables and their comparison report.[7] 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.

146.   Information on the accounting of Kyoto Protocol units has been prepared and reported in accordance with section I.E of the annex to decision 15/CMP.1, and reported in accordance with

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

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 set out in paragraph 88(a) to (j) of the annex to decision 22/CMP.1. The transactions of Kyoto Protocol units initiated by the national registry are in accordance with the requirements of the annex to decision 5/CMP.1 and the annex to decision 13/CMP.1. No discrepancies have been identified by the ITL administrator and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

2. National registry

147.   The ERT took note of the SIAR and its finding that the national registry is complete and has been submitted in accordance with the annex to decision 15/CMP.1. The ERT further noted from the SIAR and its findings that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1. The national registry also has adequate security, data safeguard and disaster recovery measures in place and its operational performance is adequate.

148.   The ERT also noted that the Czech Republic did not make publicly available all of the information referred to in paragraphs 45, 46 and 48 of the annex to decision 13/CMP.1. In particular, the Party did not state whether Article 6 project information is made public on its registry website. During the review, the Party informed the ERT that this information is indeed public and that its registry website provides a link by which the relevant information may be viewed on the UNFCCC website. The ERT recommends that the Czech Republic enhance the user interface of its registry by providing the public information referred to above and reporting thereon in its next annual submission. The Czech Republic should state clearly, in the user interface of its registry, whether this information is confidential or if there are no data to report, including data on Article 6 projects. In addition, the Czech Republic should report on any changes made to the list of public information in its next annual submission.

3. Calculation of the commitment period reserve

149.   The Czech Republic has reported its commitment period reserve in its 2009 annual submission. The Czech Republic reported its commitment period reserve to be 754,116,602 t CO_2 eq based on the national emissions in its most recently reviewed inventory (150,823.32 Gg CO_2 eq). The ERT agrees with this figure.

C. Changes to the national system

150.   The Czech Republic reported no changes to its national system in its 2009 submission. The ERT concluded that, following the submission of the outstanding QA/QC plan during this review, the Party's national system is generally in accordance with the requirements of national systems outlined in decision 19/CMP.1.

D. Changes to the national registry

151.   The Czech Republic reported no changes in its national registry in its 2009 submission. The ERT concluded that the Party'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 CMP decisions.

IX. Conclusions and recommendations

152.   The Czech Republic made its annual submission on 14 April 2009. The Party indicated that the 2009 submission is its voluntary submission under the Kyoto Protocol. The annual submission contains the GHG inventory (CRF tables and NIR) and supplementary information under Article 7, paragraph 1, of the Kyoto Protocol (information on Article 3, paragraphs 3 and 4, of the Kyoto Protocol, activities, information on Kyoto Protocol units, information on changes to the national system and the national registry). This is in line with decision 15/CMP.1.

153.   The ERT concludes that the 2009 inventory submission of the Czech Republic has been prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is complete in terms of geographical coverage, years and the Party has submitted a complete set of CRF tables for the years 1990–2007 and an NIR, which are substantially complete in terms of categories and gases.

154.   The submission on a voluntary basis of information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1

155.   The Czech Republic has reported information on its accounting of Kyoto Protocol units in accordance with section I.E of the annex to decision 15/CMP.1, and used the required reporting format tables as required by decision 14/CMP.1.

156.   The Party's inventory is generally in line with the UNFCCC reporting guidelines, the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. However, the use of tier 2 or higher methods for key categories remains very limited and there is a lack of clarity regarding the use of energy data and on the allocation of emissions from iron and steel production and waste incineration to the appropriate sectors.

157.   The voluntary submission in 2009 on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is complete and transparent and shows that the Party is prepared for this aspect of reporting under the Kyoto Protocol and its national system can identify the areas of land subject to the relevant activities.

158.   The national system continues to perform most of its required functions as set out in the annex to decision 19/CMP.1. However, the ERT noted that the lack of a QA/QC plan and inadequate implementation and documentation of the necessary QA/QC activities are major shortcomings of the national system. In response to the ERT questions on this issue, the Czech Republic submitted a QA/QC plan on 1 December 2009, which will be implemented under the direction and coordination of CHMI in the context of ISO 9001 quality standards for which CHMI is accredited. The ERT concluded that the QA/QC plan complies with the requirements of the annex to decision 19/CMP.1 on this issue and welcomes the proposal of the Czech Republic to begin immediate implementation of the plan.

159.   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.

160.   In the course of the review, the ERT formulated a number of recommendations relating to the major issues and shortcomings identified in the 2009 submission. The key recommendations are that the Czech Republic:

(a)   Implement the QA/QC plan submitted during the review as a key component of the national system and under which the appropriate QA/QC activities may be implemented from 2009 and documented for future review;

(b)   Use the available information to implement tier 2 or higher tier methods for all key categories and to reflect national circumstances as completely as possible in estimating emissions;

(c)   Apply the UNFCCC inventory principles, together with an inventory improvement plan developed in conjunction with subparagraph (a) above, in an integrated and holistic way to target inventory improvement in a systematic manner;

(d)   Improve the NIR in a way that clearly shows how AD are obtained and used, particularly for the energy sector, and ensure that the national energy balance is fully reflected in the AD being used;

(e)   Document the appropriate splitting of emissions from iron and steel and waste incineration between the sectors concerned;

(f)   Provide the missing information identified throughout this report and provide emissions estimates for relevant categories currently reported as "NE" and for which methods exist in the Revised 1996 IPCC Guidelines and/or the IPCC good practice guidance;

(g)   Archive all inventory information, including the AD input and EU ETS data, at CHMI and use the data management and tracking system currently under development to cover all such information to facilitate its retrieval for future reviews.

X. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

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

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

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

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

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

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

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

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

Status report for the Czech Republic 2009. Available at <http://unfccc.int/resource/docs/2009/asr/cze.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2009. Available at <http://unfccc.int/resource/webdocs/sai/2009.pdf>.

FCCC/ARR/2008/CZE. Report of the individual review of the greenhouse gas inventories of the Czech Republic submitted in 2007 and 2008. Available at <http://unfccc.int/resource/docs/2009/arr/cze.pdf>.

UNFCCC. Standard independent assessment report, Parts I and II. Unpublished document.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Pavel Zamyslicky (Ministry of the Environment) and Mr. Pavel Fott (Czech Hydrometeorological Institute), including additional material on the methodologies and assumptions used. The following documents were also provided by the Czech Republic:

Czech Statistical Office. 2007. *Energy Balances of the Czech Republic in 2003, 2004, 2005.* Prague.

Czech Statistical Office. 2008. *IEA Joint Questionnaires on Coal, Gas, Oil and Electricity & Heat.* Prague.

Dufek, Jiri. (unknown publication year). *Tvorba dat pro provedení emisní inventury kompatibilní s metodikou CORINAIR v souladu s inventurami prováděnými v zemích EU a OECD* (part of the research project of environmental burden caused by the transport sector).

European Environment Agency. 2009. *Application of the Emissions Trading Directive by EU Member States — reporting year 2008.* Technical report No 13/2008. Available at <http://www.eea.europa.eu/publications/technical_report_2008_13>.

Fott, Pavel. 1999. *Carbon emission factors of coal and lignite: analysis of Czech coal data and comparison to European values.* Elsevier.

Havránek, Miroslav. 2007. *Emissions of methane from solid waste disposal sites in the Czech Republic during 1990-2005 application of first order decay model.* Charles University Environment Center Working Paper 2007/02. Prague.

Holcim Česko. 2008. *Corporate Sustainable Development Report Holcim Česko 2006 – 2007.* Available at <http://www.holcim.ch/holcimweb/gc/CZ/uploads/SD_Report_CZ_EN_final.pdf>.

Hons, P., Mudrik, Z. 2003: *Podklady pro stanoveni emisi metanu z entericke fermentace skotu* (Czech country-specific data for estimation of methane emissions from enteric fermentation of cattle, AGROBIO report for CHMI). Prague.

Kolar, F., Havlikova, M., Fott, P. 2004. *Rekalkulace emisni řady metanu z entericke fermentace skotu* (Recalculation of emission series of methane from enteric fermentation of cattle, CHMI). Prague.

Ministry of the Environment of the Czech Republic. 2009. *Statistical Environmental Yearbook of the Czech Republic* The Czech Environmental Institute. Prague.

<u>Annex II</u>

Acronyms and abbreviations

AD	activity data		kg	kilogram (1 kg = 1 thousand grams)
AWMS	animal waste management system		LULUCF	land use, land-use change and forestry
CH_4	methane		Mg	megagram (1 Mg = 1 tonne)
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol		N	nitrogen
			NA	not applicable
CP	Conference of the Parties		NCV	net calorific value
CO_2	carbon dioxide		NE	not estimated
CO_2 eq	carbon dioxide equivalent		N_{ex}	nitrogen excretion
CRF	common reporting format		NH_3	ammonia
DOM	dead organic matter		NO	not occurring
EF	emission factor		N_2O	nitrous oxide
ERT	expert review team		NIR	national inventory report
EU ETS	European Union emissions trading scheme		ODS	ozone-depleting substances
F-gas	fluorinated gas		PFCs	perfluorocarbons
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		QA/QC	quality assurance/quality control
			SEF	standard electronic format
			SF_6	sulphur hexafluoride
			SIAR	standard independent assessment report
HFCs	hydrofluorocarbons		SWDL	solid waste disposal on land
IEA	International Energy Agency		SWDS	solid waste disposal sites
IEF	implied emission factor		TJ	terajoule (1 TJ = 1012 joule)
IPCC	Intergovernmental Panel on Climate Change		UNFCCC	United Nations Framework Convention on Climate Change
ITL	international transaction log			

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