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4 June 2002

**REPORT OF THE INDIVIDUAL REVIEW OF GREENHOUSE GAS INVENTORY
OF THE CZECH REPUBLIC SUBMITTED IN THE YEAR 2001¹**

(Desk review)

EXECUTIVE SUMMARY

1. This report contains the findings of the desk review of the greenhouse gas inventory submitted by the Czech Republic for the year 2001. For this review, the expert review team (ERT) examined the Czech Republic's submission of the common reporting format (CRF) tables for 1999, as well as the draft synthesis and assessment report, status report and the preliminary key source analysis prepared by the UNFCCC secretariat.
2. The review was limited by the absence of a national inventory report (NIR) and CRF data tables for the period 1990–1998. One of the principle findings of the ERT is that it is very important that the Czech Republic should supply these data and an NIR in its future submissions. The ERT welcomes the Czech Republic's stated intention to provide an NIR in English in its 2002 submission, together with 1990 CRF tables and trend tables.
3. While recognizing that the scope of the review was limited by this missing information, the ERT generally concluded that the 1999 CRF data reflected an inventory that was largely complete and appeared to be of good quality. Only a few emissions sources were not estimated, as described in more detail in the sector-specific sections below, and for several sources the Czech Republic used higher tier methods. The absence of trend tables, a time series of emissions estimates and detailed documentation in an NIR made it impossible, however, to assess the estimates in depth and to confirm the quality of the inventory.
4. It was not possible to assess the extent to which the IPCC Good Practice Guidance and Uncertainty Management in Greenhouse Gas Inventories² has been implemented, because of the missing information. The Czech Republic is encouraged fully to implement the IPCC good practice guidance, and to provide information in its NIR. In addition, the Czech Republic did not provide a key source analysis, nor any information about quality assurance/quality control (QA/QC) procedures. The ERT encourages the Czech Republic to initiate work in both these areas and to provide appropriate documentation in its NIR.

¹ In the symbol for this document, 2001 refers to the year in which the inventory was submitted, and not to the year of publication. The number (1) indicates that for the Czech Republic this is a desk review report.

² Hereinafter referred to as the IPCC good practice guidance.

I. OVERVIEW

A. Introduction

5. The Conference of the Parties (COP), at its fifth session, by its decision 6/CP.5, requested the secretariat to conduct, during the trial period, individual reviews of greenhouse gas (GHG) inventories for a limited number of Parties included in Annex I to the Convention (Annex I Parties) on a voluntary basis, according to the UNFCCC guidelines for the technical review of GHG inventories from Annex I Parties, hereinafter referred to as the review guidelines.³ The secretariat was requested to coordinate the technical reviews and to use different approaches for individual reviews, including desk reviews, centralized reviews and in-country reviews.

6. The review of the Czech Republic took place from 14 November 2001 to 8 March 2002. The desk review was carried out by a team of nominated experts from the roster of experts. Experts participating in the review were Ms. Dina Kruger (Generalist, USA), Mr. Javier Hanna Figueroa (Energy, Bolivia), Dr. Hugh Saddler (Energy, Australia), Ms. Irina B. Yesserkepova (Industrial Processes, Kazakhstan), Mr. William Kojo Ageymang Bonsu (Industrial Processes, Ghana), Mr. Luis Gerardo Ruiz Suarez (Agriculture, Mexico), Ms. Pascale Collas (Land-Use Change and Forestry, (LUCF) Canada), Mr. Francois Wencelius (Land-Use Change and Forestry, France), Ms. Maria Paz Cigaran (Waste, Peru), and Mr. Charles Russell (Waste, New Zealand). The review was coordinated by Ms. Astrid Olsson (UNFCCC secretariat). Ms. Dina Kruger and Ms. Irina B. Yesserkepova were the lead-authors of this report.

7. In accordance with the UNFCCC review guidelines, 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, in this final version of the report.

B. Inventory submission and other sources of information

8. National inventory report: The Czech Republic did not submit an NIR in 2001. The Party indicates that it did prepare an NIR in Czech, and intends to provide a report in English as part of its 2002 inventory submission.

9. Common reporting format: In its 2001 submission, the Czech Republic submitted CRF tables for the year 1999 only. CRF tables for the period 1990-1998 were not submitted. The ERT used the 1999 CRF tables in its review.

10. Other sources of information: The Czech Republic did not submit any other sources of information for the purposes of review. The ERT used the draft synthesis and assessment (S&A) report 2001, the preliminary key source analysis,⁴ and the status report prepared by the secretariat. The ERT also used the Czech Republic's response to the S&A report.

³ For the UNFCCC review guidelines and decision 6/CP.5, see document FCCC/CP/1999/7, pages 109 to 114 and 121 to 122, respectively.

⁴ The UNFCCC secretariat had identified, for each individual Party, those source categories which are *key sources* in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance. Key sources according to the tier 1 trend assessment were also identified for those Parties which provided a full CRF for the year 1990. The key sources presented in this report are based on the secretariat's preliminary key sources assessment. The might differ from the key sources identified by the Party itself.

11. Other sources of information used during the review: The preliminary guidance for experts participating in the individual review of GHG inventories, the UNFCCC reporting guidelines⁵ and the review guidelines (FCCC/CP/1999/7).

C. Emissions profile, trends and key sources

1. Emissions profile

12. The Czech Republic has the typical emissions profile of an Annex I Party. The most important GHG is CO₂, (carbon dioxide) which in 1999 accounted for 85.6% of total emissions, followed by CH₄ (methane) at 7.9%, and N₂O (nitrous oxide) at 5.9%. By sector, energy accounted for 89.2% of total emissions, agriculture 5.7%, industrial processes 2.5% and waste 2.1%.

2. Emissions trends

13. It was not possible to summarize GHG emissions trends, because the Czech Republic did not submit CRF table 10 on emissions trends in its 2001 submission. The Czech Republic has indicated that it intends to provide trend tables in its 2002 submission.

3. Key sources

14. The Czech Republic did not conduct a key source analysis as part of its 2001 submission. The secretariat conducted a preliminary tier 1 key source analysis which identified twelve key source categories, as shown in table 1.

**Table 1: Key source analysis Czech Republic basic level 1999–2001
(UNFCCC secretariat)^(a)**

Key source	Gas	Level Assessment %	Cumulative total %
Stationary combustion - coal	CO ₂	54.1	54
Stationary combustion - gas	CO ₂	12.8	67
Stationary combustion - oil	CO ₂	8.2	75
Mobile combustion - road vehicles	CO ₂	8.1	83
Fugitive emissions: coal mining and handling	CH ₄	3.4	87
Direct emissions from agricultural soils	N ₂ O	1.9	88
Emissions from cement production	CO ₂	1.5	90
Indirect N ₂ O from nitrogen used in agriculture	N ₂ O	1.4	91
Enteric fermentation in domestic livestock	CH ₄	1.3	93
Solid waste disposal sites	CH ₄	1.2	94
Nitric acid production	N ₂ O	0.7	94
Non-CO ₂ stationary combustion - coal	N ₂ O	0.6	95

^(a) See footnote 4 of this report.

⁵ 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 (FCCC/CP/1999/7), are referred to in this report as the UNFCCC reporting guidelines.

D. General assessment of the inventory

1. Completeness

15. The Czech Republic submitted inventory data for the year 1999 using the CRF of the UNFCCC reporting guidelines on annual inventories. The ERT identified some omissions in the 1999 CRF tables, including:

- (a) Tables 8(a) and 8(b) on recalculations;
- (b) Table 10 on emission trends;
- (c) Sectoral background tables 2(II).C, E and F for the industrial processes sector;
- (d) Sectoral background tables 4.C, E and F for the agriculture sector.

16. The ERT notes that no data for the years 1990 to 1998 were submitted in any form.

17. The Czech Republic did not submit an NIR as part of its 2001 submission. The ERT notes that the Czech Republic has published an NIR in Czech and indicates its intention of translating this report into English for future submissions. The Czech Republic has also indicated that it will be providing completed CRF tables for 1990 as part of its 2002 submission.

2. Cross-cutting issues

Verification and QA/QC approaches

18. As part of self-verification of estimates, the Czech Republic compared the results of the reference approach for the energy sector with the sectoral approach. No information was provided as to whether the inventory data were subject to any external verification or independent review procedures. In addition, no information was provided as to whether any QA/QC procedures were performed.

Recalculations

19. No information on recalculations was provided in the CRF. Tables 8(a) and 8(b) were not completed. In its response to the draft S&A report 2001, the Czech Republic indicated that it is currently recalculating N₂O emissions for the period 1990 to 1995 for all sectors, and CH₄ emissions from waste for the period 1990 to 1999. The Czech Republic has stated that it intends to provide these recalculations as part of the 2002 submission.

Uncertainties

20. The Czech Republic provided a qualitative uncertainty assessment.

E. Areas for further improvement

1. Issues identified by the Party

21. In its response to the draft S&A report 2001 prepared by the secretariat, the Czech Republic indicated its intention to provide an NIR and key source analysis in English in its 2002 submission. The Czech Republic also explained that it is performing recalculations on several emissions sources, and will be submitting 1990 data and trends information in its 2002 submission, once this task is complete. The Czech Republic also provided a detailed response to

the findings of the draft S&A report which specified several issues to be addressed either immediately or as resources permit.

2. Issues identified by the ERT

22. The ERT found that the actions identified by the Czech Republic will be very helpful in improving the quality of the inventory. Efforts to improve the transparency of the inventory by providing an NIR are particularly important, as described above. Information on emissions trends is also necessary. It appears that the Czech Republic will first focus on providing a completed CRF for 1990, which the ERT encourages; the ERT also emphasizes the importance of completing the CRF for the time series. Detailed recommendations by sector are provided below, followed by recommendations for improvements in cross-cutting areas.

Energy

23. Detailed information on the methodologies used (particularly for the country-specific methods used for CH₄ estimations), underlying assumptions and emissions trends should be provided to allow future ERTs to replicate inventory calculations and to assess results in greater depth. This is particularly important for the coal, oil and gas stationary combustion and mobile combustion - road vehicles subsectors, which are the largest sources in the energy sector and in the inventory as a whole.

Industrial processes

24. The ERT recommends that the Czech Republic review the allocation of iron and steel process emissions between the energy and industrial processes sectors. The ERT urges the Czech Republic to follow the IPCC good practice guidance and report these emissions under the industrial process sector, or (if that is not possible) to document clearly the rationale for the current allocation. The ERT notes that the country- and plant-specific emission factors and methods used for some source categories in this sector should be documented.

Agriculture

25. The ERT recommends that the Czech Republic provide more detailed documentation of its methods, emission factors and activity data. The ERT recognizes that the Czech Republic intends to review and update its country-specific emission factors for enteric fermentation when financial resources are available, and agrees that this is an important priority for improvement.

Land-use change and forestry (LUCF)

26. The ERT recommends that the Czech Republic provide more documentation on its methods, as well as an explanation as to why detailed data were not provided for subsectors 5.B, 5.C and 5.D.

Waste

27. The ERT encourages the Czech Republic to follow the UNFCCC reporting guidelines in the use of notation keys in this sector, which will provide more transparency and completeness. The ERT also recommends that the Czech Republic provide additional explanation of its country-specific methods and correct the allocation of factors in the CRF tables (especially for emissions from solid waste disposal sites (SWDS), if unmanaged sites are present in the

country). Finally, the ERT suggests that the factors used for the calculation of N₂O emissions should be further documented.

Good practice

28. The ERT encourages the Czech Republic to implement the IPCC good practice guidance, as far as possible. SBSTA 12 decided that Annex I Parties should apply the IPCC good practice guidance as far as possible for inventories due in 2001 and 2002, and that it should be used for inventories due in 2003 and beyond. Countries with Economies in Transition (EITs) may phase in the IPCC good practice guidance two years later than other Annex I Parties.

Verification and QA/QC

29. The ERT recommends that the Czech Republic should undertake QA/QC in its inventory, following the IPCC good practice guidance.

Uncertainty

30. The ERT recommends that the Czech Republic should prepare quantitative uncertainty analysis, following the IPCC good practice guidance.

Key source analysis

31. The ERT encourages the Czech Republic to perform a key source analysis based on both level and trend analysis, and to report its results in its future submissions.

Use of notation keys

32. The ERT notes that there are some areas where the use of notation keys should be improved, particularly in the waste sector.

3. Conformity with the UNFCCC reporting guidelines and the IPCC Guidelines

33. The national inventory submitted by the Czech Republic is not in conformity with the UNFCCC reporting guidelines because it is not complete. The missing information includes an NIR, completed 1999 CRF tables for recalculations and trends, and all CRF tables for the years 1990–1998.

34. The 1999 CRF tables are broadly consistent with the IPCC Guidelines, although a number of important tables have not been completed. In addition, it is not possible to evaluate emission methodologies sufficiently to determine whether they are fully consistent with the IPCC Guidelines and good practice guidance, because the necessary documentation has not been provided in an NIR.

II. ENERGY

A. Sector overview

35. The energy sector accounted for 89.2% of the Czech Republic's total GHG emissions in 1999, reaching 118,038 Gg. CO₂ emissions accounted for 97.5% of emissions from this sector. The sector includes six key source categories with a contribution of 87.3% to the sector's emissions: CO₂ - coal, gas and oil stationary combustion, CO₂ - mobile combustion - road vehicles, CH₄ - fugitive emissions from coal mining and handling, and N₂O - coal stationary combustion.

1. Completeness

36. The CRF included estimates for most gases and sources of emissions from the energy sector, as recommended by the IPCC Guidelines. There were a few exceptions, which include no fugitive emissions of CO₂ from coal mining and handling, no fugitive CO₂ emissions from crude oil exploration, no fugitive emissions from venting and flaring of oil and natural gas, and disaggregated information by subsector for manufacturing industries and construction.

2. Transparency and use of indicators

37. In general, the information presented in the CRF was transparent. Detailed information on the methodology used and underlying assumptions could be provided in the NIR to allow replication of inventory calculations. Use of notation keys followed the UNFCCC reporting guidelines.

3. Methodologies, emission factors and activity data

38. A tier 1 method was used to estimate CO₂ emissions from this sector. For fugitive CH₄ emissions, country-specific emission factors and tier 1/tier 3 methods were used. In the case of N₂O, a tier 2 method was used. For the other source category (mobile sources from the agriculture/forestry/fishing subsector and military fuel use), information was not provided on the methods and emission factors used for the calculations.

39. Energy consumption activity data by fuel type were taken from the Czech Energy Balance (reported by the Czech Statistical Bureau) and were converted to energy units using net calorific values. IPCC default emission factors were used for CO₂, while mainly country-specific and plant-specific emission factors were used for CH₄, and plant-specific emission factors were used for N₂O. No sources for these emission factors were provided, and the ERT recommends that the Czech Republic provide more detailed information about country-specific and plant-specific emission factors.

4. Comparison between reference and sectoral approaches

40. The GHG emissions inventory from the Czech Republic's energy sector was estimated using both the reference and the sectoral approaches. The emissions were estimated by applying emission factors to energy activity data (fuel consumption) following the IPCC Guidelines. CO₂ emissions obtained using the reference approach and the sectoral approach differed by 2% and the energy consumption differed by 0.4% for 1999.

5. Comparison with international data

41. The reference approach energy data for 1999 were 1.1% lower than the International Energy Agency (IEA) data. The CRF reported 7.2% lower for liquid fuels, while solid fuels and natural gas correspond very closely. Specific differences from the international data identified in the draft S&A report 2001 were explained in the Czech Republic's response (other hydrocarbon production, imports of naphtha, bitumen, lubricants, petroleum coke, white spirit and paraffin waxes and stock changes). Additional differences in the estimation of domestic and international jet fuel consumption were explained in the response to the draft S&A report 2001. The Czech Republic did not explain why domestic use of aviation fuel was reported only in the IEA statistics, and not in the CRF (IEA reported 45 TJ of aviation fuel consumption).

6. Accounting of fuels used for military purposes

42. The CRF reported military fuel use under the 'other sources not elsewhere specified' category, which also included mobile sources from the agriculture/forestry/ fishing subsector.

7. Treatment of feedstocks and non-energy use of fuels

43. Feedstocks were accounted for in the reference approach, following the IPCC Guidelines.

8. International bunker fuels

44. International bunkers were accounted for following the IPCC Guidelines. The latest value obtained for the jet fuel aviation bunker (4,829 TJ) reported in the Czech Republic's response to the draft S&A report differed from the value reported in the 2001 inventory submission (7,610 TJ) and signified an emission of 341.8 Gg of CO₂, which should be included in the national totals and subtracted from the reported international aviation bunker.

9. Issues identified during previous reviews

45. The S&A report 2000 noted practically the same issues as the draft S&A report 2001 regarding comparison of the reference approach with international data, and these issues remain unresolved in the 2001 inventory submission. The Czech Republic has provided explanations for the differences and inconsistencies found, and has referred to the unavailability of the final version of the Czech Energy Balance or other relevant information (for example the IEA questionnaire). The Czech Republic recognizes the need to improve processes relating to Czech GHG inventory management in order to avoid these problems in the future.

B. Key sources

1. Stationary combustion: coal, gas and oil – CO₂

46. CO₂ emissions from the stationary combustion of coal, gas and oil contributed 75% to total national emissions (54.2%, 12.8% and 8.2%, respectively).

Completeness

47. The CRF included emissions estimates for all GHGs from all subsectors of this key source, as recommended in the IPCC Guidelines. All sectors have disaggregated information by subsectors with the exception of manufacturing industries and construction.

Methodologies, activity data and emission factors

48. A tier 1 methodology was used to estimate emissions from this key source. In estimating emissions from stationary combustion, emissions from mobile sources within the agriculture/forestry/fishing subsector were clearly separated. No emissions of CO₂ from the production of iron and steel were reported under industrial processes, and so it is assumed that all these emissions are included in the total CO₂ emissions from manufacturing industries and construction stationary combustion. The ERT notes that the IPCC good practice guidance recommends the reporting of emissions from iron and steel production in the industrial processes sector, and suggests that the Czech Republic should clarify its current allocation of these emissions and consider reporting them under the industrial processes sector in future.

49. Energy consumption activity data by fuel type were taken from the Czech energy balance. Emission factors used for CO₂ estimations were taken from the IPCC Guidelines (IPCC default factors).

2. Mobile combustion: road vehicles – CO₂

50. CO₂ road transportation emissions contributed 8.1% to total national emissions.

Completeness

51. The CRF included emissions estimates for all GHGs by fuels from this key source. The CRF reported disaggregated activity data by subsectors for the transport sector, as recommended by the IPCC Guidelines.

Methodologies, activity data and emission factors

52. A tier 1 method was used to estimate emissions from this subsector. Energy consumption activity data by fuel type were taken from the Czech energy balance. Emission factors used for CO₂ estimations were taken from the IPCC Guidelines (IPCC default factors).

3. Fugitive emissions from coal mining and handling – CH₄

53. CH₄ coal mining and handling emissions contributed 3.4% to total national emissions.

Completeness

54. The estimation of CH₄ from coal mining and handling was complete. Estimates of CO₂ are not reported for this source. The CRF provided a breakdown of activity data as recommended by the IPCC Guidelines.

Methodologies, activity data and emission factors

55. A tier 3 method was used to estimate emissions from this subsector. Activity data were taken from the Czech energy balance. It is not explained in the documentation box whether coal production was reported on a run-of-mine or saleable basis. In its response to the S&A report 2000, however, the Czech Republic explained that activity data were based on saleable production. The activity data for coal production reported in the CRF were 5.7% lower than data published by the IEA. Country-specific emission factors were used for this estimate, and the sources of these emission factors are not reported.

4. Stationary combustion: coal – N₂O

56. N₂O coal stationary combustion emissions contributed 0.6% to total national emissions.

Completeness

57. The CRF included complete estimates for N₂O emissions from this key source. The CRF provided a breakdown of activity data for this subsector, as recommended by the IPCC Guidelines.

Methodologies, activity data and emission factors

58. A tier 2 method was used to estimate emissions from this subsector. Activity data were taken from the Czech energy balance. Emission factors used for N₂O estimation are plant-specific, and no sources for these emission factors are reported.

C. Non-key sources

59. The methods used to estimate emissions from energy non-key sources are mainly country-specific or advanced tiers (tier 2 or tier 3). In many cases, activity data are not reported or not estimated (e.g., exploration for oil production fields) and emission factors were either country-specific or plant-specific, but not documented.

60. The draft S&A report noted that the activity data for distribution of oil products were reported but CH₄ emissions estimates were not provided, and activity data and emissions for the “other” category were not reported. In addition, activity data and emissions for natural gas other leakage were not reported, and activity data and emissions for venting and flaring were reported as (not estimated) “NE”. CO₂ fugitive emissions from solid fuel transformation were included as a part of CO₂ emissions from manufacture of solid fuels and other energy industries, according to the Party’s response to the draft S&A report.

61. Additionally, the draft S&A report noted that the 1999 value of the CH₄ implied emission factor (IEF) for energy industries – solid fuels (3.0 kg/TJ) was among the highest values reported by Parties. In the domestic navigation subsector, activity data and emissions for residual oil were not reported and in the domestic civil aviation subsector, activity data and emissions for aviation fuel were also not reported.

62. Finally, the draft S&A report noted that the 1999 value of the CH₄ IEF in 1999 for other sectors - residential (20 kg/TJ) was the highest of all reporting Parties. The value of the CH₄ IEF was reduced from 155kg/TJ in 1998 to 100 kg/TJ in 1999 for other sectors – commercial, and the value of the CH₄ IEF was increased from 163kg/TJ in 1998 to 225 kg/TJ in 1999 for other sectors - residential.

63. In its response to the draft S&A report 2001, the Czech Republic recognized the need for more reliable CH₄ emission factors. The Czech response noted that use of the National Emission Register system (REZZO) creates uncertainties due to problems in evaluation of the right CH₄ fraction in the combined CH₄ + NMVOC sum reported by the system.

64. It is also noted that IEF values for N₂O in most sectors were higher than the IPCC Guidelines default values.

D. Areas for further improvement

1. Issues identified by the Party

65. The ERT did not receive specific information on ongoing activities in the Party. However, the Czech Republic noted in its response to the draft S&A report 2001 the need for improved processes relating to Czech GHG inventory management in order to avoid problems regarding the availability of the final version of the Czech energy balance or other relevant information (such as the IEA questionnaire) in the future.

2. Issues identified by the ERT

66. Detailed information on the methods used and underlying assumptions are necessary in order fully to assess the emissions estimates. Information on emissions trends should be provided to allow the ERT to assess the time series and replicate inventory calculations. This information is particularly important for the coal, oil and gas stationary combustion and mobile

combustion - road vehicles subsectors, which are the largest sources in the energy sector and in the inventory as a whole. Other specific recommendations include:

- (a) The ERT recommends that the Czech Republic enhance its collection of data for some sources, particularly for manufacturing industries and construction, and that this data be disaggregated by subsectors for reporting purposes;
- (b) The ERT recommends that the Czech Republic provide documentation and references for its country-specific and plant-specific emission factors, which are used primarily in the estimation of CH₄ and N₂O emissions;
- (c) Finally, the ERT suggests strengthening the institutional framework for inventory preparation, to address inconsistencies and enhance reporting. It appears that improved coordination between the Czech GHG inventory team and other institutions working in the area of energy and energy data could be useful in filling gaps.

III. INDUSTRIAL PROCESSES

A. Sector overview

67. This sector represents 2.5% of the total net emissions in CO₂ equivalent. The preliminary key source analysis carried out by the secretariat identified two key source categories in this sector. The share of these two key sources is 2.2% of total (net) emissions and 88% of emissions from the whole sector. It was not possible to observe the general trend of this sector during the period 1990 to 1999 because the data on GHG emissions from this sector were not submitted in the CRF for 1990 to 1998.

1. Completeness

68. The detailed data on GHG emissions from industrial processes can be obtained from sectoral tables 2 (I and II) and summary table 2 of the CRF. As indicated in tables 7 and 9 of the CRF, all available sources and gases addressed in the IPCC Guidelines were reported. For consumption of halocarbons and SF₆, only potential emissions were estimated. Actual emissions for this category were reported as "NE". Some sources in the sectoral tables (for example limestone and dolomite use, asphalt roofing) are indicated as "NE". CO₂ emissions from iron and steel production were reported as "IE" (included elsewhere) and were included in the energy sector emissions. The emissions from this source were roughly estimated by the ERT to be 8,887 Gg, based on iron and steel production. At this level, iron and steel emissions are substantially higher than the emissions reported for other source categories in this sector (3,442.89 Gg of CO₂ equivalent). The ERT notes that the IPCC good practice guidance recommends allocating emissions from the iron and steel industry to the industrial processes sector, and encourages the Czech Republic to do this in its future submissions.

2. Methodologies, emission factors and activity data

69. For the most part, CORINAIR methods and emission factors were used for this sector. For some categories, other methods were used, and in some cases, country-specific and plant-specific emission factors were applied. Activity data from the CRF were slightly different as compared to the United Nations data in all cases.

B. Key sources

70. Because the Czech Republic included only 1999 emissions estimates in its 2001 submission, no trend assessment could be conducted as part of the preliminary key source analysis. According to the level assessment carried out by the secretariat, two key sources were identified for this sector.

1. 2.A.1 Cement production – CO₂

71. Cement production was the largest emissions source in this sector, although this would change if iron and steel processes emissions were allocated to the sector. It accounted for 61.4% of emissions from the whole industrial sector (2,114.14 Gg), and 1.5% of total national emissions. The CRF activity data were slightly higher than United Nations data (by 0.12%). The IPCC default emission factor was used. CO₂ emissions were calculated from cement production, using a fixed cement-based emission factor which was not consistent with the IPCC good practice guidance. The tier 1 method was based on cement production data, because the amount of clinker production had evidently not been published in national statistical data.

72. Compared to emissions from cement production in 1998 based on the S&A report 2000, the level of emissions in 1999 fell by 13%. Because data for the previous years were not available, it was not possible to estimate the trend in emissions from cement production. The same emission factor was used in both 1998 and 1999.

2. 2.B.2 Nitric acid production – N₂O

73. This source contributed 0.7% to total national emissions and 29% to emissions from the industrial sector (although this would change if iron and steel processes emissions were allocated to this sector). Comparison with the United Nations data for 1999 was not possible because of the absence of international data for this year. In 1998, the national activity data from the CRF tables was higher by 18.7% as compared to international data, based on a review of the S&A report 2000. This difference could imply that national statistics take into account more sources or enterprises where nitric acid is produced, although the ERT suggests that the Czech Republic should review and explain the differences. The tier 2 method and plant-specific emission factors were used. The emission factor 0.006 t N₂O per t of nitric acid was within the range of the IPCC default values (0.002 and 0.009 t of N₂O per t of nitric acid).

C. Non-key sources

1. 2.B.1 Ammonia production – CO₂

74. As noted in the draft S&A report 2001, CO₂ emissions from ammonia production were included in the energy sector, although the national activity data on ammonia production were provided under the industrial processes sector in sectoral background tables 2(I).A-G. The emissions from this cross-cutting source were estimated as 525.0 Gg and presented as an indicator, for information only. Therefore, emissions from this source are not zero, as indicated in table 2(D)s1. The notation “IE” should be used in this case instead of 0.00. The Czech Republic should use table 9 (completeness) to indicate where this estimate was reported.

2. 2.B.1 Iron and steel production – CO₂

75. The Czech Republic indicated that emissions from this subcategory were included in the energy sector. However, the activity data were reported in the sectoral background tables and a

rough estimate of emissions was given. The notation “IE” should be used in table 2(I)s1, instead of 0.00, to indicate that emissions from this source are not zero. The Czech Republic should use table 9 to report that these emissions are included in the energy sector, subcategory 1.A.2.

3. Consumption emissions – HFCs, PFCs and SF₆

76. Actual emissions of these chemicals were not reported in the sectoral background tables. However, entries of 0.00 are reported in table 2(II); it is not clear whether there were no data or the emissions were too low. No activity data were documented or referenced. The IEF was reported as 0.00 in table 2(II).C, E.

D. Areas for further improvement

1. Issues identified the Party

77. No information was provided by the Czech Republic on planned improvements in this sector.

2. Issues identified by the ERT

78. The ERT has several recommendations for improvement of the industrial processes sector emissions figures, which include:

(a) The ERT recommends that the Czech Republic resolve the division of iron and steel processes emissions between the energy sector and the industrial processes sector, and follow the advice of the IPCC good practice guidance in allocating these emissions to the industrial processes sector;

(b) The ERT recommends that the Czech Republic document its country-specific and higher tier methods and its country- and plant-specific emission factors;

(c) In some cases, the ERT observed differences between Czech activity data and international data sources. The ERT recommends that the Czech Republic explain or resolve these differences;

(d) Finally, the ERT recommends that the Czech Republic clarify its reporting of the consumption of HFCs, PFCs and SF₆ to indicate whether emissions are actually 0.00, too small to be noted, or are not estimated due to lack of data. For these sources, in addition, activity data and emission factors should be documented;

(e) When the Czech Republic includes emissions from the industrial processes sector in other sectors, it should use the notation “IE” and use table 9 (completeness) to indicate where the emissions are reported. This would make the inventory more transparent.

E. Solvent and other product use

79. This category produced CO₂ and N₂O emissions which amount to 550.7 Gg CO₂ equivalent. Table 3 gives information on the methods and emission factors used. CO₂ emissions were estimated based on the CORINAIR method. CORINAIR and country-specific emission factors were used. For N₂O emissions, the default method and emission factors were used.

1. Degreasing and dry cleaning – CO₂

80. The draft S&A report 2001 noted that the calculated IEF (2.53 t/t) was high compared to other Parties. CO₂ emissions from this source are 131.7 Gg. This activity also emits some NMVOC.

2. Paint application

81. Emissions were 130.27 Gg of CO₂ and the emission factor was 1.36 t/t.

82. Other: Use of N₂O for anesthesia and aerosol cans. A small amount of N₂O emissions was calculated.

IV. AGRICULTURE

A. Sector overview

83. The emissions of the agriculture sector were 7,843.9 Gg CO₂ equivalent in 1999, which represents 5.7% of national emissions. The sector is responsible for three out of 12 key sources according to the assessment carried out by the secretariat. The livestock data reported in the CRF were consistent with the United Nations Food and Agriculture Organization (FAO) estimates.

1. Completeness

84. It appears that the inventory is almost complete, but without an NIR to help in the analysis that assumption can not be supported. Rice cultivation and prescribed savannah burning may be considered to be not applicable, although they were reported as zero. Field burning of agricultural residues was also reported as zero.

2. Methodologies, emission factors and activity data

85. Population characterization (head of different livestock species) was consistent for the different emissions sources: CH₄ from enteric fermentation, CH₄ from manure management, and N₂O from manure management.

86. According to the Czech Republic's response to comments on the draft S&A report 2001, a tier 2 approach was used to estimate enteric fermentation emission factors in 1994, following the IPCC methodology. The Czech Republic remarked that it realizes that a new country-specific study of emission factors is needed in order to incorporate recent developments such as the IPCC good practice guidance. It plans to undertake such a study when financial resources are available.

B. Key sources

87. Without an NIR and with CRF tables for only one year, very little can be done in addition to the draft S&A evaluation carried out by the secretariat.

C. Non-key sources

88. Without an NIR and with CRF tables for only one year, very little can be done in addition to the draft S&A evaluation carried out by the secretariat.

D. Areas for further improvement

1. Issues identified by the Party

89. The Czech Republic plans to update national values obtained in 1994. If resources are available, Czech specialists will undertake a country-specific study. If resources are not available, use of the new emission factors data base developed by the IPCC will be considered.

2. Issues identified by the ERT

90. The emission factors used in this sector are very dependent on national conditions. To facilitate the review process, therefore, the NIR and an extensive use of the documentation boxes in the CRF tables is needed.

V. LAND-USE CHANGE AND FORESTRY

A. Sector overview

1. Completeness

91. In the absence of an NIR, it is not possible to assess whether the sector was covered completely in terms of IPCC source/sink categories regarding CO₂ emissions and removals. Numerical data were provided on changes in forest and other woody biomass stocks only. Interestingly, specific data were provided regarding carbon uptake increment by trees along rivers. No data were provided on afforestation and deforestation in general, or on forest and grassland conversion (table 5.B), abandonment of managed lands (table 5.C), and CO₂ emissions and removals from soil (table 5.D) in particular. Table 9 (completeness) should provide some explanation for the exclusion of categories 5.B and 5.C. As far as soil management is concerned, the table indicated that it was not considered an important source in the country. However, it is unclear whether the source was actually insignificant, or whether reliable data were missing, or both.

92. Numerical data on emissions of non-CO₂ gases (CH₄, NO_x, and CO) were reported regarding on-site burning of cleared forest; no indications/explanations were provided in writing about these data. It is unclear why N₂O emissions associated with burning were not reported. There was, however, an isolated N₂O figure of 0.62 Gg CO₂ equivalent reported in summary table 2, but it was not reproduced anywhere else.

93. Analysis of time series consistency is not possible since 1999 was the only year reported in the 2001 submission.

2. Transparency

94. It is not possible to assess the level of transparency, since the NIR is apparently only available in Czech for the time being. No explanations were provided in the documentation boxes under tables 5.A to 5.D.

3. Methodology, emissions factors and activity data

95. It is obvious that country-specific methods were used to estimate GHG emissions and removals from the forestry sector. The evaluation of these methods was not possible in the absence of an NIR.

B. Specific sinks and sources

96. The forestry sector was a significant sink in the Czech Republic (3.4 MtCO₂ in 1999 for a total forest area of only 2.6 Mha). Although most Czech forests are managed for the commercial production of wood, the figure provided for the average annual growth rate for above-ground biomass (2.03 tC/ha) looks reasonable, and the level of annual biomass consumption from stocks (82% of the growth of stocks in 1999) leaves space for a potentially promising sink.

C. Areas for further improvement

1. Issues identified by the Party

97. The Czech Republic did not identify any planned or ongoing improvements in this sector.

2. Issues identified by the ERT

98. As a minimum, the ERT recommends that the Czech Republic should explain the exclusion of categories 5.B to 5.D. The provision of an NIR should significantly enhance the level of transparency and allow a detailed assessment of the methodologies used.

VI. WASTE

A. Sector overview

99. Emissions from the waste sector represented around 2.1% of total GHG emissions and 21.5% of total CH₄ emissions in 1999. This sector had one key source (by level assessment), CH₄ emissions from SWDS, which accounted for 1.2% of total emissions in 1999.

1. Completeness

100. The submission encompassed all waste sector tables (tables 6, 6.A, 6.B and 6.C), but they were not fully completed. The use of notation keys in sectoral and background data tables was limited. The indirect GHGs (NMVOC, CO, NO_x) and SO₂ were not covered. No calculations or notation keys were provided. Non-CO₂ gas emissions from waste incineration were allocated to the energy sector (table 1.A), but no further explanation was provided for this allocation.

2. Transparency

101. No specific information was provided about the methods, emission factors or activity data used to develop emissions estimates. An NIR was not submitted, but the Czech Republic intends to rectify this in its 2002 submission.

3. Methodologies, emission factors and activity data

102. The Czech Republic reports that it used tier 1 and tier 3 methods for emissions from SWDS. The ERT notes that there is no discussion in the IPCC Guidelines or good practice guidance about a tier 3 method, and suggests that the Czech Republic provide further explanation of its method in the NIR. The default method was used for emissions from wastewater handling, along with default and country-specific emission factors. No information was provided for waste incineration. Activity data were provided in the corresponding background tables. No detailed information about the references stated above was provided.

4. Recalculations

103. No recalculations were provided, but the Czech Republic indicated that it is currently working on CH₄ from waste for the years 1990–1999 and N₂O emissions for the period 1990–1995.

B. Key sources

1. SWDS – CH₄

104. Emissions from this source category represented 1.2% of total GHG emissions in 1999. Trends information was not provided.

105. Due to the lack or misuse of notation keys, it could not be determined whether all sub-sources were estimated. The categories for unmanaged disposal sites were not filled in with numbers or notation keys in the background table (table 6.A), while in the sectoral table 0.00 was reported (table 6). The same situation occurred for CO₂ emissions from SWDS. Emissions from indirect GHGs were not estimated.

106. It was noted in the CRF that tier 1 and tier 3 methods and country-specific emission factors were used, and that 1.792 Gg of municipal solid waste (MSW) was deposited at landfill sites in 1999. No descriptions or documentation for this information was provided, however. In addition, as noted previously, the ERT recommends that the Czech Republic provide further information on the method it has called “tier 3”, since a tier 3 method is not described in the IPCC Guidelines.

107. The methane correction factor (MCF) was reported to be 0.43 for managed disposal sites. This MCF is confirmed by the equation: $0.7 * 0.62 = 0.43$, where 0.7 is the MCF and 0.62 is the fraction of carbon released as methane. It was assumed that there are no unmanaged disposal sites in the Czech Republic. Information about DOC degraded (152.38 Gg) and CH₄ recovery (6.04 Gg) was not documented. In addition, the document boxes (for tables 6.A and 6.C) were not filled in.

C. Non-key sources

1. 6.B Wastewater handling

108. N₂O emissions from industrial wastewater were not reported and notation keys were not used. It was noted in the CRF that default methodologies and default and country-specific emission factors were used, but these were not documented or referenced. Additional information in the background table (table 6.B) was not fully provided. A default value for degradable carbon (DC) in domestic and commercial wastewater was used (18.250 kg BOD/1000 person/year), but no DC for industrial wastewater was provided. The implied emission factor for N₂O from human sewage was reported to be too high (25 kg N₂O – N/Kg sewage N produced). The Czech Republic explained that values 0.01, 0.016 and 25 were erroneously exchanged, but did not affect the resulting N₂O emissions (0.65 Gg).

2. 6.C Waste incineration

109. No references were provided for the methods, activity data or emission factors used to estimate CO₂ emissions from waste incineration. It was noted that non-CO₂ emissions were

reported in table 1.A, but the reason for this allocation was not provided. No notation keys were used.

D. Areas for further improvement

1. Issues identified by the Party

110. The Czech Republic did not report any planned or ongoing improvements in this sector.

2. Issues identified by the ERT

111. An NIR should be provided to guarantee consistency with the UNFCCC reporting guidelines. All methods, emission factors and activity data should be clearly referenced and documented to guarantee the transparency of the inventory and to enable comparison between Parties. The ERT encourages the Czech Republic to follow the UNFCCC reporting guidelines in the use of notation keys. This will guarantee the completeness of the inventory and make it easier to understand. The ERT encourages the Czech Republic to fill in the background tables and additional information boxes as far as possible.

112. The ERT encourages the Czech Republic to address the following specific points in future submissions:

(a) The real MCF should be reported (0.7 instead of 0.43). The Czech Republic should amend its allocation of emissions of SWDS to place them in the right subcategory (unmanaged solid waste disposal sites);

(b) The Czech Republic should report correctly the factors used for estimation of N₂O emissions from human sewage (annual protein consumption, N fraction and IEF) in table 6.B of the CRF.
