UNITED
NATIONS

UNFCCC Framework Convention on Climate Change

Distr.
GENERAL

FCCC/IRR/2007/AUT
8 August 2007

ENGLISH ONLY

Report of the review of the initial report of Austria

According to decision 13/CMP.1, each Annex I Party with a commitment inscribed in Annex B to the Kyoto Protocol shall submit to the secretariat, prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later, a report (the 'initial report') to facilitate the calculation of the Party's assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, and to demonstrate its capacity to account for emissions and the assigned amount. This report reflects the results of the review of the initial report of Austria conducted by an expert review team in accordance with Article 8 of the Kyoto Protocol.

CONTENTS

I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Austria, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 12 to 17 February 2007 in Vienna, Austria, and was conducted by the following team of nominated experts from the roster of experts: generalist – Mr. Mario Contaldi (Italy); energy – Mr. Francis Yamba (Zambia); industrial processes – Ms. Lisa Hanle (USA); agriculture – Mr. Vitor Gois (Portugal); land use, land-use change and forestry (LULUCF) – Mr. Xiaoquan Zhang (China); waste – Mr. Sabin Guendehou (Benin). Mr. Mario Contaldi and Mr. Francis Yamba were the lead reviewers. In addition the expert review team (ERT) reviewed the national system, the national registry, and the calculations of the Party's assigned amount and commitment period reserve (CPR), and took note of the LULUCF parameters. The review was coordinated by Ms. Astrid Olsson and Mr. Sergey Kononov (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 Austria, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

1. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial report prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report was submitted on 5 December 2006, which is in compliance with decision 13/CMP.1. In its initial report Austria refers to its 2006 greenhouse gas (GHG) inventory submission of 20 November 2006. The Party submitted revised emission estimates on 28 March 2007 in response to questions raised by the ERT during the course of the in-country visit.

2. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report and reflects the revised values of the assigned amount and the commitment period reserve provided by Austria resulting from the review process. These revised values are based on revisions of carbon dioxide (CO_2) emissions for ammonia production (see paragraph 53) and N_2O emission from waste-water handling (see paragraphs 91–92), which resulted in revisions of the total GHG emissions, including base year emissions, from 78,959,404 tonnes CO_2 equivalent as reported originally by the Party to 79,049,657 tonnes CO_2 equivalent (see paragraph 101).

Table 1. Summary of the reporting on mandatory elements in the initial report

Item	Provided	Value/year/comment
Complete GHG inventory from the base year (1990) to the most recent year available (2004)	Yes	1990–2004
Base year for HFCs, PFCs and SF_6	Yes	1990
Agreement under Article 4	Yes	87%
LULUCF parameters	Yes	Minimum tree crown cover: 30% Minimum land area: 0.05 ha Minimum tree height: 2 m
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	Austria has decided not to elect any of the activities under Article 3, paragraph 4. Austria has decided to account for each activity under Article 3, paragraph 3, for the entire commitment period.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	343 473 407 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised estimate		343 866 009 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	309 126 066 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised estimate		309 479 408 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	

5. The information in the initial report covers all elements as required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties serving as the Meeting of the Parties (CMP).

3. Transparency

6. The initial report is generally transparent, although the description of some of the methodologies used for the estimates should be improved. During the review the ERT identified extension of quality assurance/quality control (QA/QC) analysis, and the industrial processes, agriculture and energy sectors, as areas where transparency needs to be further enhanced.

4. Emission profile in the base year, trends and emission reduction target

7. In the base year (1990 for all gases), the most important GHG in Austria was CO_2, contributing 78.3 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by methane (CH_4), 11.6 per cent, and nitrous oxide (N_2O), 8.0 per cent (see figure 1). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 2.0 per cent of overall GHG emissions in the base year. The energy sector accounted for 70.4 per cent of total GHG emissions in the base year, followed by industrial processes (12.8 per cent), agriculture (11.5 per cent) and waste (4.6 per cent) (see figure 2). Total GHG emissions amounted to 79,049.66 Gg CO_2 equivalent in the base year and increased by 15.6 per cent between the base year and 2004. In a trend similar to that seen in other developed countries, increases in emissions are noticed for CO_2, HFCs and SF_6, while CH_4, N_2O and PFCs show sizeable decreases. As for many other Parties, the main increase is seen in the energy sector, while solvent and other product use, agriculture and waste show consistent decreases.

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

Figure 1. Shares of gases in total GHG emissions, base year

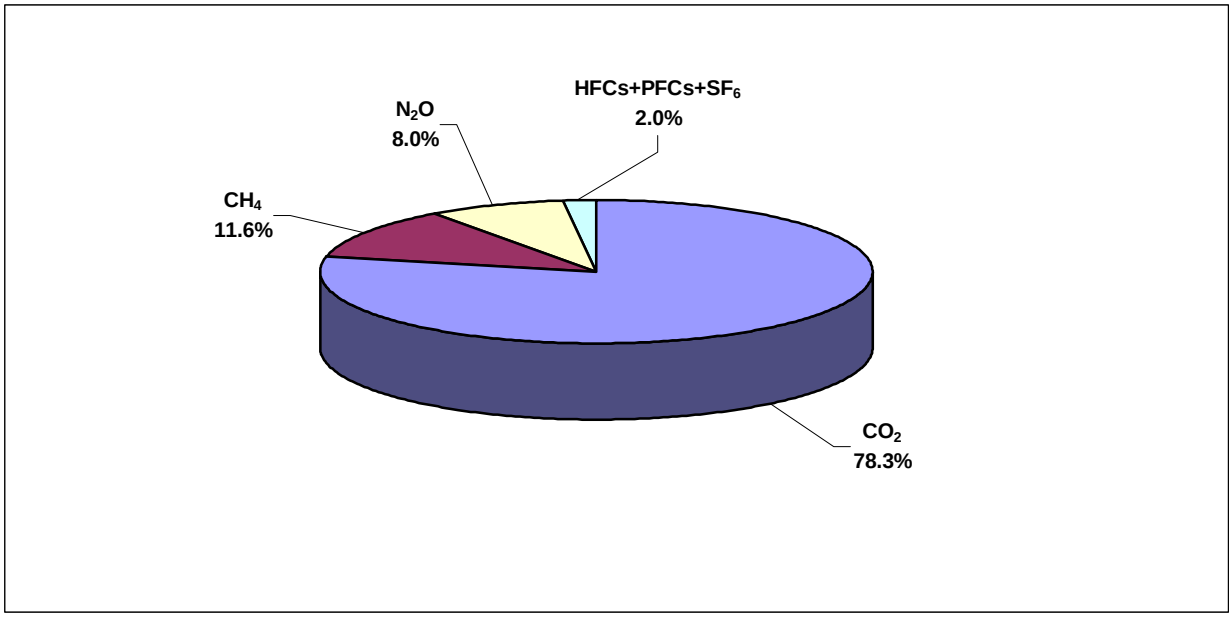
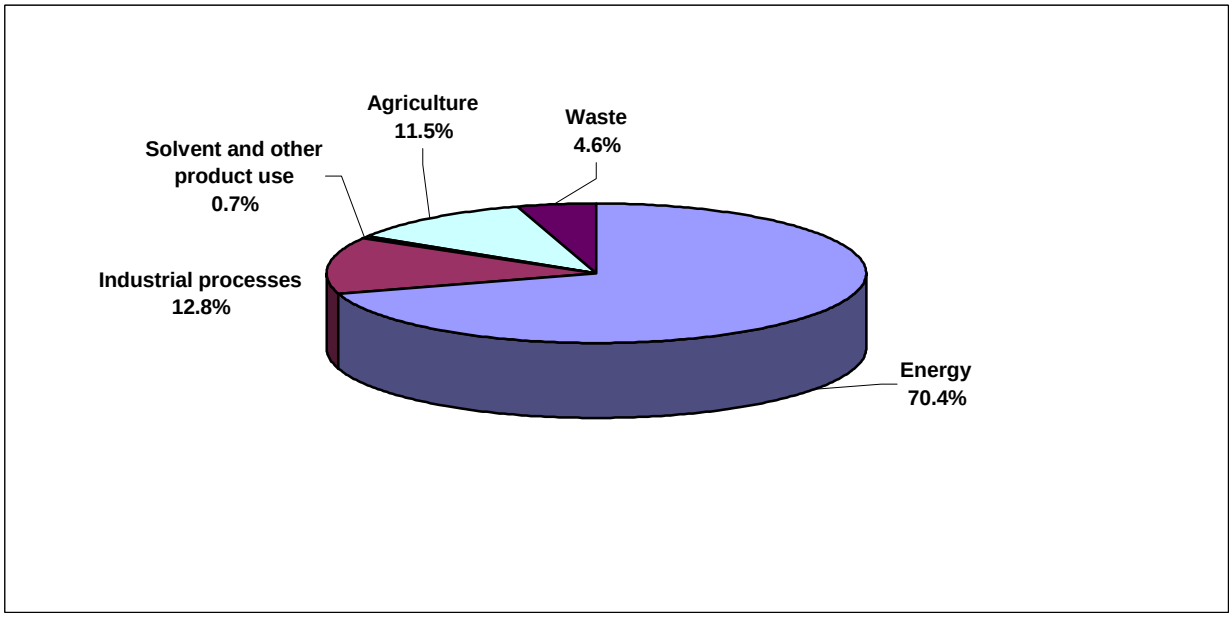


Figure 2. Shares of sectors in total GHG emissions, base year



8. Tables 2 and 3 show the greenhouse gas emissions by gas and by sector, respectively.

9. Austria's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol. Austria is part of the European Community, whose member States will meet their reduction commitment jointly in accordance with Article 4 of the Kyoto Protocol, and its quantified emission limitation is 87 per cent. Austria's assigned amount is calculated based on the Party's Article 4 commitment.

Table 2. Greenhouse gas emissions by gas, 1990–2004

GHG emissions (without LULUCF)	Gg CO_2 equivalent								Change
	Base year[a]	1990	1995	2000	2001	2002	2003	2004[a]	BY–2004 (%)
CO_2	61 932.64	61 932.64	63 664.36	66 185.96	70 179.02	71 943.21	77 561.83	77 102.68	24.5
CH_4	9 178.82	91 78.82	8 520.12	7 598.87	7 477.62	7336.10	7 364.43	7 414.06	–19.2
N_2O	6 333.33	63 33.33	6 574.85	6 192.10	6 074.87	60 69.33	6 039.35	5 311.85	–16.1
HFCs	23.03	23.03	267.34	596.26	695.10	782.44	864.92	904.39	3,826.8
PFCs	1 079.24	1 079.24	68.74	72.33	82.15	86.87	102.54	114.72	–89.4
SF_6	502.58	502.58	1 139.16	633.31	636.62	640.83	593.52	512.51	2.0

BY = Base year; LULUCF = Land use, land-use change and forestry.

[a] Austria submitted revised estimates for the base year and 2004 in the course of the initial review on 28 March 2007. These estimates differ from Austria's GHG inventory submitted in 2006.

Table 3. Greenhouse gas emissions by sector, 1990–2004

Sectors	Gg CO_2 equivalent								Change
	Base year[a]	1990	1995	2000	2001	2002	2003	2004[a]	BY–2004 (%)
Energy	55 654.51	55 654.51	57 827.98	59 890.31	63 999.09	65 187.51	70 907.99	70 582.03	26.8
Industrial processes	10 110.81	10 110.81	9 730.26	10 035.10	9 908.97	10 593.70	10 662.86	9 912.27	–2.0
Solvent and other product use	515.17	515.17	422.38	413.52	426.10	424.85	423.60	422.34	–18.0
Agriculture	9 122.44	9 122.44	9 134.47	8 333.92	8 270.44	8 157.15	8 006.61	7 863.19	–13.8
LULUCF	NA	–11 960.71	–14 411.36	–16 025.63	–18 762.22	–15 124.79	–16 596.94	–16 629.58	NA
Waste	3 646.72	3 646.72	3 119.48	2 605.97	2 540.77	2 495.60	2 525.53	2 580.38	–29.2
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	67 088.95	65 823.20	65 253.20	66 383.15	71 734.01	75 929.65	74 730.63	NA
Total (without LULUCF)	79 049.66	79 049.66	80 234.57	81 278.83	85 145.37	86 858.79	92 526.59	91 360.21	15.6

BY = Base year; LULUCF = Land use, land-use change and forestry; NA = Not applicable.

[a] Austria submitted revised estimates for the base year and 2004 in the course of the initial review on 28 March 2007. These estimates differ from Austria's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

A. National system for the estimation of anthropogenic GHG emissions by sources and sinks

10. Austria's national system is prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The national system has been developed in line with the relevant guidelines and can fulfil the requirements of the Kyoto Protocol as well as other obligations regarding its air emissions inventory that Austria has to comply with. Additionally the relevant part of the single national entity with overall responsibility for the national inventory has been accredited under International Organization for Standardization (ISO) standard 17020.

11. Table 4 shows which of the specific functions of the national system are included and described in the initial report.

Table 4. Summary of reporting on the specific functions of the national system

Reporting element	Provided	Comments
Inventory planning		
Designated single national entity*	Yes	See section II.A.1
Defined/allocated specific responsibilities for inventory development process*	Yes	See section II.A.1
Established process for approving the inventory*	Yes	See section II.A.1
Quality assurance/quality control plan*	Yes	See section II.A.2
Ways to improve inventory quality	Yes	See section II.B.3
Inventory preparation		
Key category analysis*	Yes	See section II.B.1
Estimates prepared in line with the IPCC guidelines and IPCC good practice guidance*	Yes	See section II.B.2
Sufficient activity data and emission factor collected to support methodology*	Yes	See section II.B
Quantitative uncertainty analysis*	Yes	See section II.B.2
Recalculations*	Yes	See section II.B.2
General QC (tier 1) procedures implemented*	Yes	See section II.A.2
Source/sink category-specific QC (tier 2) procedures implemented	Yes	See section II.A.2
Basic review by experts not involved in inventory	Yes	See section II.A.2
Extensive review for key categories	Yes	See section II.A.2
Periodic internal review of inventory preparation	Yes	See section II.A.2
Inventory management		
Archive inventory information*	Yes	See section II.A.3
Archive at single location	Yes	See section II.A.3
Provide ERT with access to archived information*	Yes	See section II.A.3
Respond to requests for clarifying inventory information during review process*	Yes	See section II.A.1

* Mandatory elements of the national system.

1. Institutional, legal and procedural arrangements

12. During the in-country visit, Austria explained the institutional arrangements, as part of the national system, for the preparation of the inventory. The Umweltbundesamt is the designated single national entity. Austria has a centralized inventory system, with all the work related to inventory preparation being carried out at the single national entity. The national system also clearly indicates specific responsibilities ("sector experts") for inventory preparation, including those related to choice of methods, data collection, particularly activity data (AD) and emission factors (EFs), from the statistical services and other entities, data processing and archiving, and QA/QC. The sector experts constitute the

"inspection body" in charge of the preparation and submission of the GHG inventory. The main data source for the Austrian Air Emissions Inventory is the national energy balance, as the energy sector is the largest sector. The Austrian statistical office (Statistik Austria) is required by contract with the Federal Ministry of Agriculture, Forestry, Environment and Water Management and with the Federal Ministry of Economics and Labour to prepare the national energy balance annually. The compilation of several other relevant statistics is regulated by law; other data sources include reporting obligations under national and European regulations, and reports of companies and associations.

13. The ERT considers that the legal, procedural and institutional arrangements for estimating GHG emissions are good. The arrangements are effective and reliable and ensure timely performance of the functions of the national system. However, more effort is needed to ensure that the single national entity can collect all the necessary data in a timely manner.

14. There is an established process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised by the inventory review. The responsible organization is the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

2. Quality assurance/quality control

15. Austria has developed and implemented a QA/QC plan which is in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). Additionally the part of the single national entity with overall responsibility for the national inventory (the "inspection body") has been accredited under ISO standard 17020. Specific responsibilities for the different categories ("sector experts") are defined within the inventory system, as are responsibilities for all activities related to the preparation of the inventory, including QA/QC, data management and reporting. Sector experts collect the AD, EFs and all relevant information needed for estimating the emissions. They are also responsible for QC activities that are incorporated in the Quality Management System (QMS). During the inventory preparation process, all data collected together with the emission estimates are fed into a database, where data sources are well documented for future reconstruction of the inventory. QA/QC procedures as defined in the inventory planning process are carried out before the data are submitted to the UNFCCC.

16. QA/QC procedures are performed regularly by the Party on the 43 key categories, including three LULUCF categories. Quality assurance comprises:

(a) Second-party verification of emission estimates by industry associations and regional authorities;

(b) Accreditation audits (third-party audits): during the accreditation procedure parts of the methodologies used for the inventory preparation are checked for conformity with the requirements of the IPCC good practice guidance.

17. Quality control procedures are performed during the inventory preparation by the sector experts, and a comprehensive QC procedure is implemented by the sector experts once a year, after that year's inventory work has been finished. It includes checks of formal aspects as well as aspects of contents. The ERT recommends Austria to extend the QA/QC procedures to all categories. Austria has indicated that it intends to do so in its future submissions.

3. Inventory management

18. Austria has a centralized archiving system, which includes the archiving of disaggregated emission factors, activity data, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal

documentation on QA/QC procedures, external and internal reviews, documentation on annual key categories and key category identification, and planned inventory improvements. Inventory information, both on paper and in electronic format, is stored within the single national entity (the Umweltbundesamt). All data are stored in a central network service with daily backups. During the review, the ERT was provided with the additional archived information that it requested.

B. Greenhouse gas inventory

19. In conjunction with its initial report, Austria submitted a complete set of common reporting format (CRF) tables for the years 1990–2004. The Party submitted revised emission estimates on 28 March 2007. Where needed the ERT also used previous years' submissions, including the CRF tables for the years 1990–2003.

20. During the review Austria provided the ERT with additional information sources. These documents are not part of the initial report submission but are in many cases referenced in the national inventory report (NIR). The full list of materials used during the review is provided in annex I to this report.

1. Key categories

21. Austria has reported a key category tier 1 analysis, both level and trend assessment, as part of its initial report submission. Austria has not included the LULUCF sector in its key category analysis provided in the NIR. However, key categories for the LULUCF sector are included in CRF table 7.

22. The key category analyses performed by the Party and the secretariat[2] produced consistent results. Austria identified 34 key categories, including three LULUCF categories, in the base year. In the year 2004, 33 key categories, including three LULUCF categories, were identified. The key categories were identified at a disaggregated level. An extended list of 40 sources covers 97 per cent of total emissions in 2004; this list comprises all sources identified by both level and trend assessment in all years. The secretariat identified 19 key categories in 1990 and 26 in 2004. Those categories are consistent with Austria's estimates but are identified at a higher level of aggregation. The key category analysis guides inventory preparation and efforts have been made to use category-specific good practice for key categories.

2. Cross-cutting topics

23. The inventory is consistent with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), 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).

24. The inventory is compiled in accordance with Article 7, paragraph 1, and decision 15/CMP.1.

Completeness

25. The inventory submitted is complete in terms of geographical coverage, years and sectors, and fairly complete in terms of categories and gases. For some ozone-depleting substance (ODS) substitutes (e.g., foam), all emissions may not be covered. Table 8(b) of the inventory has not been provided.

[2] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. 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.

Moreover some non-mandatory LULUCF categories (wetlands, settlements and other land) have been estimated only partially or are not estimated. The ERT found only minor discrepancies between the CRF and the NIR; see the analysis in the sector sections below for details. The time series are complete.

Transparency

26. Both the CRF tables and the NIR are transparent, and the methodologies used for estimating emissions and data sources are appropriately referenced. During the review the Party delivered all additional material requested by ERT and explained in detail all calculations made. The use of confidential data is fairly limited.

Consistency

27. Consistent time series are available for all categories. Special attention has been paid to the use of the IPCC good practice guidance methodology for key categories; however, Austria has indicated that there may be problems with the availability of long-term data collection for some categories (number of animals for some categories, use of fertilizers in agriculture, coal gases).

Comparability

28. Austria has submitted CRF tables for all years 1990–2004. Data reporting is complete for all years and the tables are fully comparable with those submitted by other Parties.

Accuracy

29. The inventory is accurate, and uncertainty analysis has been performed for all key categories. Efforts have been made to use category-specific good practice for the estimation of key category emissions.

Recalculations

30. The national system can ensure that recalculations of previously submitted estimates of GHG emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance. For inventory management a reliable data management system has been established to fulfil the data collecting and reporting requirements; however, there have been some problems with long-term data collection for some categories. A reliable data management system ensures the necessary documentation and archiving for future reconstruction of the inventory, and consequently enables easy access to up-to-date and previously submitted data for the quantitative evaluation of recalculations. In the event of recalculations being necessary due to a change of methodology or change of an emission factor, they have to be approved by the head of the "inspection body".

31. The ERT noted that recalculations of the time series from the base year to 2004 have been undertaken. The effect of the recalculations was increases in the estimates of total emissions by 0.49 per cent in the base year, and by 1.05 per cent in 2004. The recalculations were made in response to previous ERT recommendations and include:

(a) An increase of reported CO_2 emissions (1990: +1.3 per cent) due to revised coke oven coke net calorific values (NCVs);

(b) A revised EF for natural gas CO_2;

(c) A revised EF for CO_2 from industrial waste;

(d) Lower estimated emissions from industrial processes, mainly due to the use of an improved methodology for ammonia production;

(e) A decrease of reported CH_4 emissions (1990: –6.3 per cent) due to methodological changes in the categories managed waste disposal on land and waste-water handling;

(f) An increase of reported N_2O emissions (1990: +9.5 per cent) due to the revision of the nitrogen (N) excretion rates in the agriculture sector, which led to higher estimates of emissions from manure management and agricultural soils;

(g) A decrease of reported emissions of fluorinated compounds (1990: –9.0 per cent), which is the result of the incorporation of a new study on HFC use and emissions in the subcategory foam blowing.

Uncertainties

32. The Party has provided an uncertainty analysis for the 43 key categories, including three LULUCF categories and for the inventory in total, following the IPCC good practice guidance. The Umweltbundesamt routinely performs a tier 1 uncertainty estimate in-house (each sector expert has to make its own uncertainty estimate) based on the results of an in-depth study (tier 2) performed in 1999 by a consultant. The study will be repeated and extended in scope in 2007. Uncertainty analysis has been carried out on the 43 key categories, including three LULUCF categories. The ERT recommends Austria to carry out the uncertainty analysis for all categories.

33. The uncertainty of the total emissions estimate is estimated as 2.4 per cent in the base year and 1.8 per cent in 2004. Austria explained during the review that it has performed a tier 1 uncertainty estimate using the "error propagation" technique for all years from 1991 to 2004. For the inventory years 1990 and 1997 a study (Winiwarter and Rypdal, 2001) performed a full Monte Carlo analysis (tier 2), but only for the key categories identified in those years. This analysis produced independent uncertainty estimates for all categories and EFs. Austria explained during the in-country review that it has performed a tier 1 uncertainty estimate using the error propagation methodology for all other years, based on these independent uncertainty estimates, for all categories and EFs. After the year 1999 uncertainty estimates have been updated for new key categories that have been identified and where changes in methodology have occurred. Austria has contracted a new study that will update the uncertainty estimates for all the identified categories for the inventory year 2007. The new study will be based on the Monte Carlo approach and its results should enable Austria to perform a tier 2 analysis each year.

3. Areas for further improvement identified by the Party

34. The NIR identifies areas for improvement. Source-specific planned improvements are: full implementation of tier 2 uncertainty analysis for all categories; and the updating and extending of the reporting of those LULUCF categories that have been estimated only partially or are not estimated (wetlands, settlements and other land).

4. Areas for further improvement identified by the ERT

35. The ERT identified the following cross-cutting issues for improvement. The Party should:

(a) Provide more precise descriptions of those methodologies that differ from the IPCC methodologies in the relevant NIR chapters, and highlight in the NIR all the work that has been done on QA/QC of the inventory information;

(b) Extend its QA/QC and uncertainty analyses to all categories of the inventory, evaluate thoroughly the reliability of its statistical data and provide quantified uncertainty estimates.

36. Recommended improvements relating to specific source categories are presented in the relevant sector sections of this report.

5. Energy

Sector overview

37. In the base year (1990), the energy sector accounted for 70.4 per cent of total national GHG emissions without LULUCF. The most important energy categories were other (27.1 per cent), energy industries (24.6 per cent), manufacturing industries and construction (24.5 per cent), and transport (22.9 per cent).

38. The inventory addresses all the IPCC categories for the energy sector and covers all years and all gases. The level of disaggregation for the allocation of fuel consumption to individual end-use sectors is in accordance with the IPCC category classification. All the CRF tables, including the sectoral background data tables, are provided.

39. Values for activity data for stationary combustion and fugitive emissions from coal mines come from the national energy balance provided by Statistik Austria. AD for fugitive emissions from oil and natural gas are provided by the industrial associations. The energy balance is continuously updated and is subject to internal quality control, including feedback from local authorities on the quality of the data being provided for their use.

40. The reporting of the energy sector is transparent and the methodologies used are well documented in the NIR. The IPCC tier 2 methodology is used to estimate emissions from stationary combustion. Emissions of CH_4 and N_2O from road transportation are calculated using the GLOBEMI model. Emissions from off-road machinery (including navigation and railways) are calculated using the GEORG model. The NIR provides sufficient information to make it possible to follow the calculations. The notation keys are used correctly. However, multilateral operations are reported as "included elsewhere" ("IE"). The ERT recommends Austria to report them as "not occurring" ("NO") since emissions from multilateral operations do not occur in Austria.

41. Austria has continued to carry out recalculations, which are well documented in the NIR, for the energy sector. These have been undertaken as a result of changes to methodologies, activity data and emission factors. For the energy sector, the recalculations resulted in an increase by 1.2 per cent in the base year, compared to the 2005 submission, with the largest changes occurring in manufacturing industries and construction, energy industries, and natural gas distribution and refinery/storage.

42. QA/QC procedures for the energy sector are part of the total QMS system, which has now been accredited. Statistik Austria plans to provide additional documentation giving a more detailed quantification of uncertainties in the Party's next submission. Some of the major improvements which have been undertaken over the years as a result of recommendations from previous ERTs include: the updating of the EFs for CO_2 from waste and natural gas; the allocation of waste incineration with energy recovery in public electricity and heat production (it was previously reported under waste incineration); a shift of blast furnace process emissions from iron and steel to iron and steel production, and a shift of auto producers from other (manufacturing industries and construction) to subcategories; and more detailed disaggregation of fuel types (waste biomass, petroleum coke). Other improvements include QA/QC and time-series consistency, and the provision of sectoral data consistent with the International Energy Agency (IEA) data except for road transportation and off-road activities.

Reference and sectoral approaches

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

43. CO_2 emissions from fuel combustion have been calculated using the reference approach and the sectoral approach. For the base year, there is a difference of 5.15 per cent in the estimates of CO_2 emissions between the two. Explanations are provided in the documentation box to CRF table 1.A(c). In addition, the NIR provides explanations for the fluctuations in the differences between the approaches.

The explanations include: the use of IPCC default NCVs in the reference approach, while in the sectoral approach actual NCVs are taken to calculate energy consumption; and the use of different EFs (carbon content) for the sectoral and reference approaches.

44. Apparent consumption in Austria's reference approach for the base year corresponds closely to the IEA data. For the base year, there is a difference of 0.1 per cent between the reference approach and the IEA data. The errors are within 1.0 per cent for all available years. The growth rate between 1990 and 2004 for total apparent consumption was 30 per cent according to the CRF tables and 29 per cent according to the IEA.

International bunker fuels

45. The fuel consumption and emissions from international aviation and international marine bunkers are reported separately in CRF table 1.C. Furthermore, fuel consumption for domestic aviation is separated from that for international aviation; table 1.C provides information on this separation. Given the geographical location of Austria, no emissions are reported for marine bunker fuels.

Feedstocks and non-energy use of fuels

46. Information on feedstocks and non-energy use is well documented both in the CRF (table 1.A(d)) and in the NIR.

Key categories

Public electricity and heat production: solid/gaseous fuels – CO_2

47. The CO_2 implied emission factor (IEF) from solid fuels for public electricity and heat production decreased by 5 per cent between the base year (101.75 t/TJ) and 2004 (96.6 t/TJ). Austria explained that the fluctuations are due to changes in the fuel mix over the whole time series. The Party is encouraged to report this explanation in the NIR.

48. The ERT noted that the Party uses an IEF of 55.4 t/TJ for estimating CO_2 emissions from natural gas following the recommendations of previous ERTs that it check the CO_2 IEF for natural gas and update it if needed. The CO_2 IEF previously used (55.0 t/TJ) was the lowest of reporting Parties and lower than the IPCC default value (56.1 t/TJ). The ERT encourages the Party to use NCV and EF values based on actual measurements of natural gas composition obtained from the suppliers.

Road transportation: gasoline – CO_2

49. The CO_2 IEF for gasoline (75.22 t/TJ) in the base year is the highest of reporting Parties and higher than the IPCC default value for Europe (73.1 t/TJ). This is due to the use of a low NCV for gasoline (41.6 TJ/t). This NCV is not consistent with standard product specifications and should be re-determined based on refinery measurements. The ERT recommends the Party to revise the NCV estimates using actual data. However, the estimates of CO_2 emissions are correct as the calculations are based on a constant CO_2 EF in kg CO_2/t fuel (which is consistent with the IPCC default) and on weight-based fuel sales.

Fugitive emissions: oil and natural gas – CH_4

50. Austria uses the IPCC tier 1 method based on default emission factors to estimate CH_4 emissions from natural gas distribution. Since CH_4 emissions from natural gas are a key category, the ERT encourages Austria to use a tier 2 method to estimate CH_4 emissions from natural gas distribution.

6. Industrial processes and solvent and other product use

Sector overview

51. In the base year (1990), emissions from the industrial processes sector accounted for 12.8 per cent of total national GHG emissions. CO_2 accounted for 75.0 per cent of the total emissions of the sector, PFCs for 10.7 per cent, N_2O for 9.0 per cent, SF_6 for 5.0 per cent), and HFCs and CH_4 together for 0.4 per cent. Metals production was the primary source of emissions (49.7 per cent), followed by mineral products (32.3 per cent) and the chemical industry (15.0 per cent). In the base year, solvent and other product use accounted for 0.7 per cent of total national GHG emissions. N_2O emissions accounted for 54.9 per cent of this total and CO_2 emissions for 45.1 per cent.

52. Austria has produced a complete inventory of emissions for these sectors. It covers all categories and gases that occurred in the country in the base year. Appropriate documentation has been included for categories that did not occur or were not applicable. The methodologies used to estimate emissions in the base year are also transparently identified. In most cases, Austria has company-specific data for industrial sources in the most recent years, but not for the base year. Where company-specific data are not available for earlier years, Austria has explained in a transparent way how the IEFs from more recent data were applied to the time series and why this approach is consistent with national circumstances.

Key categories

Ammonia production – CO_2

53. Austria estimates CO_2 and CH_4 emissions from ammonia production. During the in-country review, Austria indicated that it assumes that all carbon in the natural gas feedstock is fully converted to CO_2. Given the assumption of full conversion to CO_2, the ERT concluded that CH_4 emissions from ammonia production are already accounted for in the CO_2 estimate. Furthermore, the ERT recommended that Austria investigate any possible double counting of CO_2 emissions between ammonia and urea production. Austria agreed with the ERT's recommendations, and subsequently provided revised estimates that reduced the estimates of CO_2 emissions from ammonia production by the quantity double counted.

Iron and steel production – CO_2

54. Iron and steel is the largest industrial source of CO_2 emissions in Austria. Consistently with the IPCC good practice guidance, a tier 2 methodology is applied to estimate emissions from integrated iron and steel mills and electric arc furnaces. Austria distinguishes between combustion- and process-related emissions; this is done on the basis of a national study. Although it notes that there is a potential for misallocation of emissions between the energy and industrial processes sectors for a given year, the estimates of total GHG emissions for the industry are of high quality.

Cement production – CO_2

55. Consistently with the IPCC good practice guidance, Austria uses a country-specific method that is based on plant-specific data on the composition of the raw meal. These plant-specific data were available in the base year. Austria documents the QA/QC procedures in a transparent way to ensure data quality.

Aluminium production – PFCs

56. Although primary aluminium production was terminated in Austria in 1992, it was a significant source of emissions in the base year. Consistently with the IPCC good practice guidance for a key category, Austria has applied country-specific operating parameters to production statistics to estimate these PFC emissions. Although this is not transparently documented in the NIR, the ERT learned during

the review that these country-specific parameters were compared to, and determined to be consistent with, international statistics. The ERT encourages Austria to include this QA/QC documentation in its future inventory submissions.

Nitric acid production – N_2O

57. Emissions from nitric acid production declined by 69.2 per cent between the base year and 2004, primarily due to the introduction of a new catalyst and, later, the installation of an N_2O decomposition facility. The methodology used by Austria to estimate these emissions is consistent with the IPCC good practice guidance. Since 1998, emissions have been reported directly by the company concerned from continuous measurements. The company confirmed that plant technology did not change between 1990 and 1998, and therefore the 1998 IEF for each plant was applied to the earlier years.

Non-key categories

Soda ash production and use – CO_2

58. Austria includes CO_2 emissions from soda ash used only in the glass industry. During the review, it indicated that it did not know of, or consider, any other industries where soda ash might be consumed. The ERT encourages Austria to review the additional uses of soda ash described in the Revised 1996 IPCC Guidelines (e.g., soaps and detergents, pulp and paper production and water treatment).

7. Agriculture

Sector overview

59. In the base year (1990), total emissions from the agriculture sector amounted to 9,122.44 Gg CO_2 equivalent and accounted for 11.5 per cent of total national GHG emissions. CH_4 accounted for 53.0 per cent of the sector's emissions and N_2O for 47.0 per cent. Emissions in 2004 were 13.8 per cent lower than in the base year. All relevant categories and GHGs are reported. Additionally, emissions of CH_4 from the spreading of sludge on soil as a fertilizer are estimated and reported under agricultural soils. The reporting for agriculture is consistent and complete for all years and categories.

60. The inventory uses a set of country-specific methodologies, in accordance with the IPCC good practice guidance, and they are supported by extensive background documentation based on surveys and scientific studies that reflect the country-specific conditions of all the Austrian regions. In particular, Austria uses country-specific methodologies to estimate gross energy intake, volatile solids excretion (VS) and N excretion rates from cattle in a consistent way for the source categories enteric fermentation (CH_4) and manure management (CH_4, N_2O). The ERT welcomes this development, but recommends that Austria further improve the transparency of the NIR by providing more information about the supporting studies and showing whether they reflect field data, expert judgement or studies reported in the scientific literature.

61. There are still some inconsistencies in the time series. The major problem concerns dairy cows, the numbers of which are estimated by subtracting the number of premium cows (representing mother cows) from the number of total cows. This is causing inter-annual variations of the numbers of dairy cows and mother cows. The ERT recommends that Austria make further efforts to improve the consistency of the time series.

Key categories

Enteric fermentation – CH_4

62. The time series of the CH_4 IEF for dairy cattle shows possible inconsistencies, with an inter-annual increase of 13.3 per cent from 1994 to 1995; this corresponds to a similar increase in milk yield

which reflects (a) a conversion of some dairy cows to mother cows over those two years, following milk quota constraints and financial support for the change, and (b) a change in the statistical procedures that Statistik Austria used to quantify milk yield. This does not affect the figures for emissions in the base year, because the time series for dairy cows and mother cows show inter-annual variations in the same years which counterbalance the inconsistencies in milk yield, but it does cause problems in the transparency of the inventory and its comparability with those of other Parties. The ERT therefore recommends that Austria make efforts to improve the consistency in the time trend of milk yield, dairy cows and mother cows.

63. Austria uses country-specific CH_4 IEFs for non-dairy cattle, set individually for each cattle subclass, but they are constant over the period 1990–2005. The EF for the subclass mother/suckling cows is not well documented in the NIR and the basic assumption – an annual milk yield of 3,000 kg/head/year – appears to be high when compared both to the underlying data in the Revised 1996 IPCC Guidelines and to the milk yield reported by Austria for dairy cows for the base year. Further information/documentation provided during the in-country review explains this value: the reasons for it are (a) the existence of a long milking period (8–11 months) and (b) the use of the breeds Fleckvie, Simmental and Pinzgau with a high milking capacity and whose calves have high daily weight gains (1.020–1.493 kg/day) and feeding requirements. The milk production per mother cow appears to be consistent with the growth rate of calves and the solid feed intake that Austria uses to derive the country-specific CH_4 IEF for young cattle less than one year old, and supporting documentation was provided by Austria during the in-country visit. The ERT recommends that Austria provide further explanation of the comparatively high CH_4 IEF for suckling cows in the base year in its future NIRs.

Manure management – N_2O

64. In CRF table 4.B(b), the population of swine multiplied by the corresponding N excretion ratio does not equal the total N excretion rate reported in the same table. According to explanations provided by Austria, the reason for this is that "animal numbers of young swine were not taken into account because the emission factor for breeding sows already includes nursery and growing pigs". Although this does not affect the emission estimates in the base year, it may introduce some lack of transparency and comparability, and the ERT recommends Austria to revise its reporting procedures.

Agricultural soils – N_2O

65. For activity data, Austria uses annual sales figures for synthetic N fertilizers, adjusted to two-year averages, while in accordance with the IPCC good practice guidance activity data should be fertilizer use. The trend over the period 1990–1994 shows strong inter-annual variations, but Austria, during the in-country visit, stated that these inter-annual variations are the result only of market conditions, the effect of taxes, and inter-annual variations in price and stocking, and that annual use of fertilizer should show a more stable evolution. The ERT recommends that Austria consider revising the time series by determining actual fertilizer use and improve the consistency of the time series.

66. From the information provided during the in-country visit, Austria does not take account of some sources of nitrogen applied to soil, such as compost produced from waste water. These emissions could be underestimated, and the ERT recommends Austria to clarify this issue and add this source if appropriate.

67. Austria has not provided sufficient information about the volatilization ratios of ammonia (NH_3) and nitrogen oxide (NO_X) from animal manure in the NIR. The methodology and parameters referenced are from the EMEP/CORINAIR Guidebook and are included in Austria's Informative Report submitted under the United Nations Economic Commission for Europe (UN-ECE) Convention on Long-Range Transboundary Air Pollution (CLRTAP). Because Austria is currently using a different $Frac_{GASM}$ for each specific animal waste management system (AWMS), while only one value is reported in CRF table 4.D, with no clear explanation as to which specific AWMS is applicable, the transparency of the

inventory is impaired. The ERT recommends Austria to include the relevant information about the determination of volatilization ratios in its future NIRs.

Non-key categories

Agricultural soils – CH_4

68. Austria reports a small quantity of CH_4 emissions from the application of sewage sludge to soils under "other". The ERT acknowledged that Austria is using an appropriate country-specific methodology which, although different from the methodology proposed in the IPCC good practice guidance and the Revised 1996 IPCC Guidelines, is well documented and does not cause double counting of emissions reported in the waste sector.

8. Land use, land-use change and forestry

Sector overview

69. In the base year, the LULUCF sector represented a net sink of 11,960.71 Gg CO_2 equivalent, offsetting 15.1 per cent of total national GHG emissions.

70. The CRF for 1990 includes estimates of CO_2 emissions/removals for all six land-use categories in the LULUCF sector, and N_2O emissions from disturbance associated with land-use conversion to cropland, as well as N_2O and CH_4 emissions from wildfire in forests. Carbon stock changes in living biomass, dead organic matter and soils, as well as CO_2 emissions from liming, are reported under the relevant categories.

71. Austria's GHG inventory for the base year is largely based on its National Forest Inventory (NFI), which has a very comprehensive QA/QC system. The Party reports a complete uncertainty analysis for the categories forest land, cropland and grassland. Tier 1 methods in the IPCC good practice guidance for LULUCF are used to estimate emissions/removals for the key categories cropland remaining cropland and grassland remaining grassland, and partly for forest land remaining forest land. The ERT recommends the Party to use higher-tier methods in its future submissions.

72. The ERT noted that an additional parameter (0.66) has been introduced when the Party uses the IPCC tier 1 method to estimate carbon stock changes in soils for land-use conversions. This is not consistent with the IPCC good practice guidance for LULUCF and tends to underestimate soil carbon stock changes in the base year. The ERT therefore recommends the Party either to follow the IPCC tier 1 method strictly or to develop a country-specific method.

Key categories

Forest land remaining forest land – CO_2

73. Net CO_2 removals for forest land remaining forest land in the base year amounted to 12,003.42 Gg CO_2. Allometric equations are used to estimate the carbon stock changes in living biomass of the non-commercial part of trees.

74. The areas of land converted to forest land are estimated based on NFIs for the periods 1986–1990 and 1992–1996. This is not consistent with the IPCC good practice guidance for LULUCF, which defines the land-use conversion period as 20 years or longer. The current breakdown of the category forest land tends to overestimate CO_2 removals for forest land remaining forest land in the base year. The ERT recommends the Party to use 20 years as the conversion period to distinguish the subcategories for forest land, with help from statistical data and/or satellite imagery/aerial photography.

75. Carbon stock changes in soils for forest land remaining forest land are assumed to be zero based on the tier 1 method in the IPCC good practice guidance for LULUCF. A reassessment of the forest soil

inventory is currently ongoing, and there is a proposal to derive models. The ERT acknowledges that this would make it possible to improve the estimates of carbon stock changes in forest soils.

Cropland remaining cropland – CO_2

76. Cropland remaining cropland in Austria was a net sink of 484.74 Gg CO_2 in the base year. Except for soil carbon stock changes, where a country-specific method is used, tier 1 methods and the default parameters in the IPCC good practice guidance for LULUCF are used. The ERT recommends Austria to use higher-tier methods for this category.

Land converted to grassland – CO_2

77. Austria has established a complete land use and land-use change matrix related to grassland. This provides the basis for complete and transparent estimating and reporting of CO_2 removals/emissions for the category land converted to grassland. This category was a net source of 444.57 Gg CO_2 in the base year. Except for soil carbon stock changes, where a country-specific method is used, tier 1 methods and the default parameters in the IPCC good practice guidance for LULUCF are used. The ERT recommends Austria to use higher-tier methods for this category.

Non-key categories

Wetlands, settlements and other land – CO_2

78. For the categories wetlands, settlements and other land, Austria estimates CO_2 removals/emissions for forest land converted to [x] land. Land remaining [x] land is reported as "not estimated" ("NE"), while all other categories are reported as "NO". Uncertainties have not been analysed for any of these categories. The ERT encourages Austria to extend its reporting and its uncertainty analysis in these categories.

Land converted to forest land and agricultural lime application – CO_2

79. The methods and parameters used for estimating soil carbon stock change for land conversion to and from forests are not clearly documented in the NIR, nor are those used for calculating activity data (the amount of lime applied) for the category carbon emissions from agricultural lime application. The ERT recommends Austria to present the formula and related parameters in its future submissions.

9. Waste

Sector overview

80. In the base year (1990), the waste sector emitted 3,646.72 Gg CO_2 equivalent, or 4.6 per cent of total national GHG emissions without LULUCF. Emissions from the sector were at their highest in the base year as the policy of separate collection of bio-organic and paper waste, which explains the changes in the composition of landfilled waste, was not then fully implemented. CH_4 is the main GHG emitted by the sector and solid waste disposal on land is the major category.

81. The emissions inventory for the waste sector is almost complete in the base year since it covers all categories and gases except that an estimate for a part of waste-water handling is missing.

82. Following the recommendation of the previous review, Austria has made considerable improvements to both the methodology and data preparation. The methodologies used are transparent, although some additional explanations had to be provided during the in-country visit.

83. Recalculations for 1990 have been carried out because of methodological changes and the collection of new data. During the review, Austria carried out additional recalculations in response to the ERT's comments, in order to complete the emission estimates for waste-water handling.

84. QA/QC is implemented for data collection as well as for estimating emissions. The Party provided uncertainty estimates for some categories based on a study conducted in 1999–2001 and expert judgement.

85. It is praiseworthy that Austria reports the emissions correctly under the appropriate sectors when there is a link between the waste and other sectors. For example, it reports CH_4 from solid waste disposal on land and CH_4 from anaerobic digestion of waste water and sludge in the energy sector, as landfill gas and CH_4 from anaerobic digestion are used to produce energy. Also when waste incineration is used for energy purposes, Austria reports the emissions in the energy sector. Emissions from sludge spreading on agricultural soils are reported in the agriculture sector.

Key categories

Solid waste disposal on land – CH_4

86. Following a recommendation by the previous review, Austria has moved from using a country-specific method, which overestimates emissions, to the IPCC tier 2 methodology. The use of IPCC tier 2 is in line with the IPCC good practice guidance as this is a key category.

87. Austria has used a combination of well-documented country-specific parameters (degradable organic carbon (DOC), half-life periods, fraction of CH_4 in landfill gas, share of landfill gas recovered) and IPCC default values (for the fraction of DOC dissimilated, and the methane correction factor (MCF)). The DOC is highest in the base year due to the progressive implementation of the policy of separating bio-organic waste and paper after 1990. The DOC was 0.20 Gg C/Gg waste in the base year but had decreased to 0.12 by 2004.

88. To fill in data gaps, Austria has used extrapolation based on a driver (gross domestic product, GDP) to estimate activity data of non-residual waste and provided the spreadsheet used to apply the method. A review of the spreadsheet enabled the ERT to conclude that the method is correctly applied.

89. Austria reports CH_4 in landfill gas recovered and used for energy purposes in the energy sector. The ERT encourages it to continue to do so.

Waste-water handling – N_2O

90. Austria uses a transparent country-specific method to estimate N_2O emissions from human sewage, which is in line with the IPCC good practice guidance. The country-specific method is an improvement on the IPCC default method because two additional factors — the percentage of nitrogen that is denitrificated, and the amount of waste water treated in sewage plants – have been added to better account for the national circumstances of Austria.

91. However, the estimate in this category is incomplete because this method applies only to human sewage treated in sewage plants and does not take into account the fact that N_2O emissions from human sewage occur regardless of whether the sewage is treated in a sewage plant or not. As the share of the population not connected to sewage plants was about 41 per cent in 1990, excluding that population leads to an underestimate of emissions for the base year.

92. After discussion during the in-country visit, the Party agreed to apply the country-specific method to the proportion of the population that is connected to sewage plants and use the IPCC default for the population that is not so connected in order to make the emissions estimate complete. During the review Austria provided a well-based recalculation which shows that the missing estimate for the base year was 0.29 Gg N_2O, which is 91.00 Gg CO_2 equivalent.

93. Regarding N_2O emissions from industrial waste-water handling, relevant activity data do not exist. Austria therefore uses expert judgement which assumes that the N_2O emissions from industrial

waste-water handling account for 30 per cent of total N_2O from waste water. This assumption is not supported by data at present, but Austria plans to conduct a study on N_2O emissions from industrial waste-water handling.

Non-key categories

Waste-water handling – CH_4

94. The estimates for this category have been prepared using a transparent method and are complete: they cover CH_4 emissions from municipal and domestic waste-water handling. The Party has used IPCC defaults for biochemical oxygen demand (BOD_5) as well as for methane producing capacity (B_o). A well-documented country-specific MCF for municipal waste water, which was derived from national studies taking into account the temperature in septic tanks and cesspools, has been used. During the review Austria provided data on the proportion of the population that is connected to septic tanks and cesspools. With regard to industrial waste water, treatment is usually carried out under aerobic conditions. Emissions relating to the energy recovered from the anaerobic digestion of both municipal sewage sludge and industrial waste water and sludge are reported in the energy sector, and the CH_4 emitted from sludge spread on agricultural soils is reported under agriculture, which is in line with the IPCC good practice guidance.

Waste incineration – CO_2, CH_4, N_2O

95. The Party uses a mix of well-documented country-specific data and IPCC default emission factors. Emissions from incineration with energy recovery are reported in the energy sector and emissions from incineration without energy recovery are reported in the waste sector.

96. During the review, the Party provided data on different types of waste incinerated with and without energy recovery (municipal waste, clinical waste, waste oil) and the ERT noted that Austria has activity data for the base year.

Compost production – CH_4, N_2O

97. Austria uses a country-specific method and emission factors (for mechanical–biological-treated residual waste; bio-waste, loppings, home composting; sewage sludge) from country-specific studies. The method and EFs are correctly applied.

C. Calculation of the assigned amount

98. The assigned amount pursuant to Article 3, paragraphs 7 and 8, is calculated in accordance with the annex to decision 13/CMP.1.

99. Austria's base year is 1990 and the Party has chosen 1990 as its base year for HFCs, PFCs and SF_6. Austria's quantified emission limitation is 92 per cent as specified in Annex B to the Kyoto Protocol. Austria is part of the European Community, whose member States will meet their reduction commitment jointly in accordance with Article 4 of the Kyoto Protocol, and its quantified emission limitation is 87 per cent. Austria's assigned amount is calculated based on the Party's Article 4 commitment.

100. Based on Austria's original base year emissions, excluding land-use change – 78,959.40 Gg CO_2 equivalent – and its Kyoto Protocol target of 87 per cent, the Party calculated its assigned amount to be 343,473,407 tonnes CO_2 equivalent.

101. In response to inventory issues identified during the review, the Party submitted revised estimates of its base year inventory (79,049.66 Gg CO_2 equivalent), which resulted in a recalculation of the assigned amount. Based on the revised estimates, the Party calculates its assigned amount to be 343,866,009 tonnes CO_2 equivalent. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

102. The calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1.

103. Based on its original calculated assigned amount – 343,473,407 tonnes CO_2 equivalent – Austria calculated its commitment period reserve to be 309,126,006 tonnes CO_2 equivalent.

104. In response to inventory issues identified during the review, the Party submitted revised estimates of its base year inventory, which resulted in a recalculation of the assigned amount. Based on the revised estimates (79,049.66 Gg CO_2 equivalent), the Party calculates its commitment period reserve to be 309,479,408 tonnes CO_2 equivalent. The ERT agrees with this figure.

E. National registry

105. Austria has provided most of the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). Information on the international transaction log (ITL) connection and testing was not available because connection was scheduled to start in May 2007. In particular the procedures to comply with items d) and e) of paragraph 32 of decision 15/CMP.1 were not fully prepared and operative to the date of the visit: see paragraph 109 for further details. The information provided is transparent and in accordance with the UNFCCC reporting guidelines requirements (decision 15/CMP.1). The ERT recommends that Austria provide more detailed information in its next inventory report under the Kyoto Protocol.

106. Table 5 summarizes the information on the mandatory reporting elements on the national registry system, as stipulated by decisions 13/CMP.1 and 5/CMP.1.

107. During the in-country visit, the ERT was informed that the internal operational test of the registry for network connection would be completed by April 2007. The initialization process was expected to be completed by mid-May and the registry to be fully operational by end of December 2007. Information on the national registry of Austria is publicly available through the Internet (URL <http://www.emissionshandelsregister.at>).

108. The ERT was also informed about the procedures and security measures to minimize discrepancies, terminate transactions and correct problems, and minimize operator error. These procedures and security measures are described in the initial report in the section “National Registry Austria. Information required under Article 7 of the Kyoto Protocol: Description of the National Registry”, table 2. These procedures and security measures cannot be fully tested until an ITL is operative; however, as a preliminary evaluation, Austria confirms that internal checks and routines are being implemented as far as possible.

109. The ERT acknowledged the efforts made by Austria to put in place adequate procedures and security measures. The registry services are being provided by a professional information technology (IT) services host (Siemens Austria) which ensures that operations are performed by more than one computer per time. Computers are located in a protected area. Programs are routinely mirrored to other computers sited at another location in Austria, using a high-speed network. The ERT gained the general impression that Austria attaches high importance to and has allocated sufficient resources, including human resources, for the development, operation and maintenance of the registry.

Table 5. Summary of reporting on the national registry system

Reporting element	Provided / referenced	Comments
Registry administrator		
Name and contact information	Yes	
Cooperation with other Parties in a consolidated system		
Names of other Parties with which Austria cooperates, or clarification that no such cooperation exists	Yes	No such cooperation exists[a]
Database structure and capacity of the national registry		
Description of the database structure	Yes	
Description of the capacity of the national registry	Yes	
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems	Yes	
Procedures for minimizing and handling of discrepancies		
Description of the procedures employed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units	Yes	
Description of the steps taken to terminate transactions where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction	Yes	
Prevention of unauthorized manipulations and operator error		
An overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error	Yes	
An overview of how these measures are kept up to date	Yes	
User interface of the national registry		
A list of the information publicly accessible by means of the user interface to the national registry	Yes	
The Internet address of the interface to Austria's national registry	Yes	<http://www.emissionshandelsregister.at>
Integrity of data storage and recovery		
A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster	Yes	
Test results		
The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems	Partially	

[a] Austria states in its initial report that "Austria cooperates with the member states of the European Union and with the supplementary transaction log (STL) and the registry of the European Community by maintaining the national registries in a consolidated system. The names of the other member states are: Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and United Kingdom."

110. At the review date, complete information on procedures and tests was not available because some of them still have to be implemented. As a preliminary evaluation the ERT was informed that almost 50 per cent of the procedures needed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units have been prepared and are currently working within the Community Independent Transaction Log (CITL, the European Union ITL). Those procedures refer to account management, the allocation of emissions, the verification of emissions and the surrender/retirement of quotas. Additional procedures that will exploit the full potential of the European Union emissions trading scheme, including connection with the clean development mechanism (CDM), are in the process of being implemented/tested.

111. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report (IAR) that was forwarded to the ERT by the administrator of the ITL, pursuant to decision 16/CP.10, on 13 July 2007.

112. The ERT reiterated the main findings of this report, including that the registry has fulfilled all of its obligations regarding conformity with the DES. These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery.

113. Based on the results of the technical assessment, as reported in the IAR, the ERT concluded that Austria's national registry is fully compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding operational performance or public availability of information prior to the operational phase.

F. Land use, land-use change and forestry parameters and election of activities

114. Table 6 shows the Party's choice of parameters for forest definition as well as its elections for Article 3, paragraphs 3 and 4, activities in accordance with decision 16/CMP.1.

Table 6. Selection of LULUCF parameters

Parameters for forest definition		
Minimum tree cover	30%	
Minimum land area	0.05 ha	
Minimum tree height	2 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3 activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4 activities		
Forest land management	Not elected	Not applicable
Cropland management	Not elected	Not applicable
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

115. The parameters chosen for the definition of forest are within the agreed values in decision 16/CMP.1 and are consistent with what Austria has reported to the Food and Agriculture Organization of the United Nations (FAO). With regard to the identification of forest areas, Austria defines a minimum forest width of 10 metres.

116. Austria has decided to account for afforestation (A), reforestation (R) and deforestation (D) activities for the entire commitment period, and plans to identify ARD lands on the basis of the permanent sampling plot of its NFI. Plans are in place for NFIs for the periods 2007–2009 and 2011–2013. The ERT suggests that Austria pay special attention to the identification of ARD geographical location and the anthropogenic features of ARD activities.

III. Conclusions and recommendations

A. Conclusions

117. The expert review team concluded that the information provided by Austria is complete and submitted in accordance with the relevant provisions of paragraphs 5, 6, 7 and 8 of the annex to decision 13/CMP.1, section I of the annex to decision 15/CMP.1, and relevant decisions of the CMP; that the

assigned amount pursuant to Article 3, paragraphs 7 and 8, is calculated in accordance with the annex to decision 13/CMP.1, and is consistent with the revised inventory estimates as submitted and reviewed; and that the calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1, and the LULUCF definitions are within the agreed range.

118. The national system of Austria has been developed in line with the guidelines for national systems (decision 19/CMP.1) and can fulfil the requirements of the Kyoto Protocol as well as other obligations regarding its air emissions inventory that Austria has to comply with. The initial report describes all the mandatory elements of the national system.

119. Austria has submitted a complete set of CRF tables for the years 1990–2004 and an NIR which is complete in terms of geographical coverage, years and sectors, and fairly complete in terms of categories and gases. During the in-country review the Party and the ERT agreed on some changes to be made for some categories in the industrial processes, agriculture and waste sectors, and there was no need for adjustments.

120. Based on Austria's base year emissions – 79,049,657 tonnes CO_2 equivalent, including the revised estimates provided in the industrial processes and waste sectors – and its Kyoto Protocol target – 87 per cent – the Party calculates its assigned amount to be 343,866,009 tonnes CO_2 equivalent. Austria calculates its commitment period reserve to be 309,479,408 tonnes CO_2 equivalent. The ERT agrees with these figures.

121. Austria's choice of the parameters to define forest (minimum tree cover: 30 per cent; minimum land area: 0.05 ha; minimum tree height: 2 metres) are in accordance with decision 16/CMP.1. Austria has elected not to account for any activities under Article 3, paragraph 4, of the Kyoto Protocol. Austria has also elected commitment period accounting for the Article 3, paragraph 3, activities.

122. Based on the results of the in-country review visit and the technical assessment, as reported in the independent assessment report, the ERT concluded that Austria's national registry is fully compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1.

B. Recommendations

123. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of Austria's information presented in the initial report. The key recommendations[3] are that Austria:

- In the general part: extend its QA/QC and uncertainty analyses to all categories of the inventory;
- In the energy sector: revise the NCV estimates of gasoline using actual data, consistent with the reported EF;
- In the agriculture sector: make further efforts to improve the consistency of the time series of the number of dairy cows and mother cows; include more information in its NIR about methodologies used to estimate gross energy intake, VS and N excretion rates from cattle, in particular providing supporting studies and showing whether they reflect field data, expert judgement or literature studies; and provide further explanation of the comparatively high CH_4 IEF for suckling cows in the base year in its future NIRs;
- For LULUCF: use higher-tier methods in its future submissions to estimate emissions/removals for the key categories forest land remaining forest land, cropland remaining cropland and grassland remaining grassland; use 20 years as the conversion period to distinguish the subcategories of forest

[3] For a complete list of recommendations, the relevant sections of this report should be consulted.

land in order to be consistent with the IPCC good practice guidance for LULUCF; and document in the NIR the methods and parameters used for estimating soil carbon stock change for land conversion to and from forests, and for calculating activity data (the amount of lime applied) for the category carbon emissions from agricultural lime application.

C. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

IPCC. Good practice guidance and uncertainty management in national greenhouse gas inventories, 2000. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

IPCC. Good practice guidance for land use, land-use change and forestry, 2003. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

IPCC/OECD/IEA. Revised 1996 IPCC Guidelines for national greenhouse gas inventories, volumes 1–3, 1997. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

UNFCCC. 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/2004/8. Available at <http://unfccc.int/resource/docs/2004/sbsta/08.pdf>.

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

UNFCCC. Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol. FCCC/KP/CMP/2005/8/Add.3. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

UNFCCC. Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. FCCC/KP/CMP/2005/8/Add.2. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

UNFCCC. Guidelines for review under Article 8 of the Kyoto Protocol. FCCC/KP/CMP/2005/8/Add.3. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

UNFCCC secretariat. Status report for Austria. 2006. Available at <http://unfccc.int/resource/docs/2006/asr/aut.pdf>.

UNFCCC secretariat. Synthesis and assessment report on the greenhouse gas inventories submitted in 2006. FCCC/WEB/SAI/2006. Available at <http://unfccc.int/resource/docs/webdocs/sai/sa_2006.pdf>.

UNFCCC secretariat. Austria: Report of the individual review of the greenhouse gas inventory submitted in the year 2005. FCCC/WEB/ARR/2005/AUT. Available at <http://unfccc.int/resource/docs/2006/arr/aut.pdf>.

UNFCCC secretariat. Austria: Independent assessment report of the national registry of Austria. Reg_IAR_AT_2007_1. Will be available at <www.unfccc.int>.

B. Additional information provided by the Party

Amon B, Hopfner-Sixt K and Amon T. 2002. *Emission Inventory for the Agricultural Sector in Austria*. *Manure Management*. Institute of Agricultural, Environmental and Energy Engineering (BOKU – University of Agriculture, Vienna), July.

Anderl M. 2007a. Compilations and synthesis of relevant information in the most important references in NIR for agriculture. Provided in written format, after request by the ERT, on 15 February 2007.

Anderl M. 2007b. Comments about milk yield and length of suckling in Austria. Including consultation with ZAR (Federation of Austrian Cattle Breeders). Provided in written format to the ERT on 15 February 2007.

Anderl M. 2007c. Comments about milk yield, including consultation with Mr. Häusler, agriculture expert, and provided in written format to the ERT on 17 February 2007.

Gebetsroither E, Strebl F and Orthofer R. 2002. *Greenhouse Gas Emissions from Enteric Fermentation in Austria*. ARC Seibersdorf research, July.

Gilberg U, de Lauretis R, Gonella B and Villanueva A. 2005. *Waste Management in Europe and the Landfill Directive*. Background paper from the ETC/RWM to the ETC/ACC Workshop on 'Inventories and Projections of Greenhouse Gas Emissions from Waste.' European Environment Agency. Project 2.1.2.1.

Goetz B. 1998. *Stickstoffbilanz der österreichischen Landwirtschaft nach den Vorgaben der OECD. Aktualisierte und erweiterte Fassung*. Umweltbundesamt, Wien, UBA BE-087a. July.

Grabner R, Klatzer R, Meier W, Steinwidder A, Stoeger E and Toifl G. 2004. Mutterkuh und Ochsenhaltung 2003. *Landwirtschaftliche & Forstwirtschaftliche Beratung*.

Grubber L, Guggenberger T, Steinwidder A, Schauer A and Häusler-Irdning J. 2001. Prediction of feed intake of dairy cows by statistical models using animal and nutritional factors. *Proc. Soc. Nutr. Physiology*.

Gruber L and Poetsch E. M. 2005. *Calculation of Nitrogen Excretion of Dairy Cows in Austria. Die Bodenkultur,* in print.

Gruber L and Steinwidder A. 1996. Einfluß der Fütterung auf die Stickstoff- und Phosphorausscheidung landwirtschaftlicher Nutztiere – Modellkalkulationen auf Basis einer Literaturübersicht in *Die Bodenkultur – Austrian Journal of Agricultural Research*, 47. Band/ Heft 4/Dezember 1996. ISSN 0006-5471, WUV-Universitätsverlag, Wien.

Grüner Bericht 2006. Table 3.1.15.

Kausel A. 1998. Ein halbes Jahrhundert des Erfolges. Der ökonomische Aufstieg Österreichs im OECD-Raum seit 1950. *Finanznachrichten Wochenschrift für Wirtschaftspolitik*. Sondernummer.

Kierne L and Schneeberger W. 1999. Strukturanalyse der Betriebe mit der OEPUL Massnahme "Verzicht auf bestimmte estragssteigernde Betriebsmittel (Betrieb)". *Der Foerderungsdientst* 47(6).

Lebensministerium. 2006. *Richtlinien für die sachgerechte Düngung*.

Obernosterer R, Smutny R, Jäger E and Merl A. 2004. HFKW Gase in Dämmschäumen des Bauwesens. Umweltbundesamt, Internal Report, Villach, Austria.

Rolland C and Oliva J. 2004. *Erfassung von Deponiegas – Statusbericht von Österreichischen Deponien*. Umweltbundesamt BE 238, Wien.

Rolland C and Schiebengraf M. 2003. *Biologisch Abbaubarer Kohlenstoff im Restmüll*. Umweltbundesamt BE 236, Wien.

Sharf S, Schneider M and Sethner G. 1997. *Zur Situation der Verwertung und Entsorgung des kommunale Klärschlammes in Österreich*. Umweltbundesamt.

Steinwidder A, Häusler J, Schauer A, Maierhofer G, Gruber L, Gasteiner J and Podstatzky L. (2006): *Einfluss des Absetztermins auf die Milchleistung und Körpermasse von Mutterkühen sowie die Zuwachsleistung von Mutterkuh-Jungrindern*. Versuchsbericht. Extensively managed beef cows – Effects on animal health, reproductive success, performance of calves and economics. Experiment 2004 to 2008. Interim report. Agricultural Research and Education Centre, HBLFA Raumberg-Gumpenstein.

Steinwidder A and Guggenberger T. 2003. *Erhebungen zur Futteraufnahme und Nahrstoffversorgung von Milchkühen sowie Nährstoffbilanzierung auf Grünlandbetrieben in Österreich*.

Steinwidder A and Gold H. 1989. *Produktionstechnik und Gebrauchskreuzungen in der Mutterkuhhaltung*.

Strebl F, Gebetsrouther E and Orthofer R. 2003. *Greenhouse Gas Emissions from Agricultural Soils in Austria*. ARC Seibersdorf research, revised version, Feb. 2003.

Umweltbundesamt 2006. Austria's Informative Inventory Report (IIR) 2006. Submission under the UNECE Convention on Long-range Transboundary Air Pollution. Wien.

Winiwarter W and Rypdal K. 2001. Assessing the uncertainty associated with national greenhouse gas emission inventories: A case study for Austria. *Atmospheric Environment* 35, 5425–5440.

Annex II

Acronyms and abbreviations

AD	activity data
ARD	afforestation, reforestation and deforestation
AWMS	animal waste management system
C	carbon
CDM	clean development mechanism
CH_4	methane
CITL	Community Independent Transaction Log (European Community)
CMP	Conference of the Parties serving as the Meeting of the Parties
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DOC	degradable organic carbon
EF	emission factor
ERT	expert review team
EU	European Union
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
GJ	gigajoule (1 GJ = 10^9 joule)
GWP	global warming potential
HFCs	hydrofluorocarbons
IAR	independent assessment report
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITL	international transaction log
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane correction factor
Mg	megagram (1 Mg = 1 tonne)
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NFI	National Forest Inventory
NIR	national inventory report
NO	not occurring
ODS	ozone-depleting substance
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
QMS	quality management system
SF_6	sulphur hexafluoride
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change
VS	volatile solids

- - - - -