UNITED NATIONS
NATIONS UNIES

FRAMEWORK CONVENTION ON CLIMATE CHANGE - Secretariat
CONVENTION - CADRE SUR LES CHANGEMENTS CLIMATIQUES - Secrétariat

FCCC/WEB/IRI(3)/2003/FRA 4 February 2004

FRANCE

REPORT OF THE INDIVIDUAL REVIEW OF THE GREENHOUSE GAS INVENTORY SUBMITTED IN THE YEAR 2003[1]

(Centralized review)

I. OVERVIEW

A. Introduction

1. In accordance with decision 19/CP.8 of the Conference of the Parties, the United Nations Framework Convention on Climate Change (UNFCCC) secretariat coordinated a centralized review of the 2003 greenhouse gas (GHG) inventory submission of France. The review took place from 8 to 13 September 2003 in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalists – Mr. William Kojo Agyemang-Bonsu (Ghana) and Mr. Jan Pretel (Czech Republic); Energy – Mr. Audace Ndayizeye (Burundi), Mr. Poorundeo Ramgolam (Mauritius) and Ms. Karen Treanton (International Energy Agency, IEA); Industrial Processes – Mr. Jamidu Katima (Tanzania) and Mr. Jos G. J. Olivier (Netherlands); Agriculture – Ms. Tajda Mekinda-Majaron (Republic of Slovenia) and Ms. Penny Reyenga (Australia); Land-use Change and Forestry (LUCF) – Mr. Daniel Martino (Uruguay) and Mr. Nijavalli H. Ravindranath (India); Waste – Ms. Tatiana Tugui (Republic of Moldova) and Ms. Irina B. Yesserkepova (Kazakhstan). Mr. William Kojo Agyemang-Bonsu and Ms. Penny Reyenga were the lead reviewers of this review. The review was coordinated by Ms. Astrid Olsson (UNFCCC secretariat).

2. In accordance with the UNFCCC "Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention", a draft version of this report was communicated to the Government of France, 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

3. In its 2003 submission, France submitted a complete set of common reporting format (CRF) tables for the years 1990–2001 and a national inventory report (NIR). Where needed the expert review team (ERT) also used previous years' submissions, additional information provided during the review and other information. The full list of materials used during the review is provided in annex 1 to this report.

C. Emission profiles and trends

4. In the year 2001, the most important GHG in France was carbon dioxide (CO_2), contributing 73.4 per cent to total[2] national GHG emissions expressed in CO_2 equivalent, followed by nitrous oxide

[1] In the symbol for this document, 2003 refers to the year in which the inventory was submitted, and not to the year of publication. The number (3) indicates that this is a centralized review report.

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

(N_2O) – 14.3 per cent, and methane (CH_4) – 11.5 per cent. Perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) taken together contributed 2.1 per cent of the overall GHG emissions in the country. The Energy sector accounted for 72.1 per cent of total GHG emissions, followed by Agriculture (17.5 per cent), Industrial Processes (7.4 per cent) and Waste (2.5 per cent). Total GHG emissions (excluding LUCF) amounted to 560,756.83 Gg CO_2 equivalent and decreased by 0.003 per cent from 1990 to 2001. However, with LUCF, total GHG emissions amounted to 501,788.82 Gg CO_2 equivalent and decreased by 2.1 per cent from 1990 to 2001. There has been a general decrease in GHG emissions from 1990 to 2001 in all sectors except the Energy sector, for which emissions increased by 5.4 per cent in 2001 compared to 1990. Emissions from the Industrial Processes, Solvent and Other Product Use, Agriculture and Waste sectors decreased by 24.8 per cent, 8.1 per cent, 6.1 per cent and 4.0 per cent, respectively.

D. Key sources

5. France has performed a key source analysis using tier 1 methodology for both level and trend assessment as part of its 2003 submission. The key sources analyses performed by the Party and the secretariat[3] produced different results. The key source analyses performed by France and the secretariat both had CO_2 emissions from road transport as the highest-emitting source category, contributing 23.4 per cent of total emissions in terms of absolute level, but the analysis performed by the Party had N_2O emissions from agricultural soils as the second-highest source of GHGs, with a contribution of 9.2 per cent—apparently because France did not distinguish between direct and indirect emissions from agricultural soils.

E. Main findings

6. The NIR and the CRF are consistent with the UNFCCC reporting guidelines and the *Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC Guidelines), and the choice of methodology conforms to the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). The extent of documentation provided, both in the CRF tables and in the NIR, ensures transparency; however, this is marred to some extent by the lack of use of notation keys in some of the CRF tables. France performed extensive recalculations for all sectors during the 2003 submission and has documented the rationale for the recalculations.

F. Cross-cutting topics

Completeness

7. France's inventory is by and large complete, covering all major source and sink categories. The direct greenhouse gases – CO_2, CH_4 and N_2O are reported, as are disaggregated actual emissions of HFCs, PFCs and SF_6. However, some sectoral background data in tables 4.E and 5.C are not provided. Tables 1.A(b) and 1.A(d) are only provided for the years 1990 and 1999–2001, tables 5.A and 5.B are not provided for the years 1998–1999, and table 5.D is not provided for the years 1991–1999. Notation keys are used in a limited way in the tables.

3 The 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 providing a full CRF for the year 1990. Where the Party has performed a key source analysis, the key sources presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key source assessment conducted by the secretariat.

Transparency

8. The submission of CRF tables for 1990–2001 together with the NIR provides an acceptable level of transparency, although this could be improved in future submissions. Specifically, the use of notation keys in all CRF tables would improve transparency. The choice of methodology, the extent of the documentation, and the uncertainty analyses performed and documented in the NIR make the French submission transparent.

Recalculations and time series consistency

9. The ERT noted that recalculations reported by the Party took into account updated statistics, improved knowledge, changes in methodology and further reporting requirements as specified in the UNFCCC reporting guidelines. The emission estimates for the period 1990–2000 provided in the 2002 submission have all been recalculated in the 2003 submission. This has led to increases in the figures for emissions of CO_2 (by 1.6 per cent), CH_4 (by 8.9 per cent) and N_2O (by 5.8 per cent) for 2000.

Uncertainties

10. The NIR contains a discussion and quantitative estimations of uncertainties relating to the inventory. This has been performed in line with the UNFCCC reporting guidelines and the IPCC good practice guidance on uncertainty management. The uncertainty calculations have been used in the key sources analysis and in the recalculation of emissions. The Party has noted, however, that more work in this area will be undertaken in future to improve the quality of its reporting.

Verification and quality assurance/quality control approaches

11. The 2003 NIR provides information on quality assurance and quality control (QA/QC) procedures, and verification activities, but France has not set up any national or sectoral QA/QC plan.

Follow-up to previous reviews

12. The major area of improvement since the last review has been the development of a quantitative uncertainty analysis. The disaggregation of fuel types in the Energy sector has also improved the key source analysis. The major pending issues include the development of QA/AC plan and the separation of direct and indirect N_2O emissions from the Agriculture sector. In response to the draft of this report the Party responded that although in the determination of key sources, direct and indirect N_2O emissions are taken as a whole, in the reporting, table 4.D is entirely fulfilled and the distinction is made.

G. Areas for further improvement

Identified by the Party

13. In the NIR, the Party has identified that further work is needed on the quantitative estimation of uncertainties for use in key source analyses and recalculation of emissions in order to improve the quality of its reporting. The ERT noted that France is planning to improve the NIR by describing all methodologies used in detail in order to increase the transparency of its inventory. France is planning to improve its QA/QC procedures by moving towards the implementation of ISO 9001.

Identified by the ERT

14. The ERT identifies the following major areas for improvement related to cross-cutting issues in the French inventory: the establishment of national inventory system; and the institution of a formal national QA/QC plan. France is encouraged to provide complete CRF tables for all years in the time series and also to use appropriate notation keys in the CRF in order to ensure transparency.

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

II. ENERGY

A. Sector overview

16. In 2001, energy-related GHG emissions were 404,361 Gg, representing 96 per cent of CO_2 emissions and 72.1 per cent of total GHG emissions (excluding LUCF). Between 1990 and 2001, CO_2 emissions from the Energy sector increased by 5.9 per cent, CH_4 emissions decreased by 32.3 per cent, and N_2O emissions increased by 54.1 per cent. For other non-key gases, sulphur dioxide (SO_2) emissions decreased by 50.9 per cent, nitrogen oxide (NO_X) emissions decreased by 23.7 per cent, non-methane volatile organic compounds (NMVOC) emissions decreased by 44.9 per cent and emissions of carbon monoxide (CO) decreased by 44.1 per cent.

17. For Energy, complete inventories have been submitted for the years 1990–2001. All the CRF tables for the sector have been submitted, with the exception of some of the reference approach tables.

18. For the Energy sector, the EMEP/CORINAIR methodology has been used to obtain most of the emission estimates. Activity data (AD), emission factors (EFs) and methodologies used are consistent with the IPCC good practice guidance. However, the NIR indicates that detailed country-specific EFs have been developed for the French inventory and they are too numerous to reproduce in the NIR. In addition, although summaries of the methodologies used have been described in the NIR with brief descriptions of what is included, it is not possible to evaluate the inventory fully by using just the NIR.

19. An IPCC tier 1 uncertainty analysis has been performed and the results are given at the individual source category level. The ERT noted that France is planning research work on methods for the more precise estimation of emissions and the uncertainties associated with them.

20. There is only a brief mention of the QA/QC procedures that have been carried out for the preparation of the inventory. For the Energy sector, first there was a comparison with the simplified reference approach calculated using the energy balances from the Observatoire de l'Énergie. Second, various French administrations were consulted and the estimation methods examined at a meeting in December 2002. The ERT noted that this is an issue already identified by the Party.

21. France has provided recalculations that are documented in CRF table 8. For 1.A.1.a Energy Industries, 1.A.1.b Petroleum Refining, 1.A.1.c Solid Fuel Transformation and 1.A.2 Other Sectors, recalculations have been done for N_2O because of a review of the EFs of all fuels since 1990. In response to a remark in the in-country review of the French 2001 submission, waste incineration plants with energy recovery have been transferred from category 6.C to category 1.A.1.a for CO_2, CH_4 and N_2O. Activity data for solid fuel transformation plants (1.A.1.c) have been updated. For 1.A.2 Manufacturing Industries and Construction, the recalculations resulted from the use of new methodologies to calculate CO_2 and CH_4 emissions for specified industries. The net result of these recalculations on the Energy sector is an increase of +1.0 per cent in the figures for emissions in the base year (–0.05 per cent for CO_2, +0.86 per cent for CH_4 and +4.03 per cent for N_2O).

B. Reference and sectoral approaches

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

22. France has submitted a "simplified" reference approach prepared by the Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique (CITEPA), based on data from the Observatoire de l'Énergie, for the years 1990–2001 in the NIR. The difference between the simplified reference approach and the sectoral approach varies from –0.4 per cent to +3.4 per cent, with an average of 1.6 per cent. However, the ERT felt that the simplified calculations are not detailed enough to provide verification for the sectoral approach.

23. France has also provided a standard reference approach calculation for 1990, 1999 and 2000. In 2000, there is difference of 9.7 per cent between the two approaches. Some partial explanations have

been provided in the documentation box of CRF table 1.A(c), but no attempt has been made to quantify these differences. There is also a small error in the links between table 1.A(d) and table 1.A(b). For "other oil" products (i.e., wax, paraffins, white spirit and other), no carbon stored is shown in the reference approach table. The ERT encourages France to follow the IPCC good practice guidance and the IPCC Guidelines and submit a complete reference approach calculation for all years.

24. The ERT noted that the Energy data in the French reference approach for 2000 correspond very closely to the IEA data. This is a result of a reconciliation project by the French administration, and both data sets are now transmitted by the Observatoire de l'Énergie, whereas previously the Ministère de l'Industrie transmitted the data to IEA.

International bunker fuels

25. Comparing the AD in the CRF and the IEA data for domestic and international aviation for 2000, there are a number of differences in the data for various items: for jet kerosene, the difference between the two data sets is –22.1 per cent for civil aviation and +11.1 per cent for international civil aviation. The NIR indicates that fuel consumption for international aviation is deduced from the balance between the total sales of aviation fuel and estimated domestic traffic consumption, which is calculated using a detailed approach (based on individual aircraft movements and using International Civil Aviation Organization (ICAO), MEET and CORINAIR sources of information). For marine bunkers, the UN Economic Commission for Europe (ECE) definition for international marine traffic is used. Thus part of French bunkers is counted with international marine bunkers. The ERT encourages France to allocate emissions from both marine and aviation bunkers in a more transparent way and to reconcile the differences between the UNFCCC data and the IEA data.

26. In CRF table 1.C, the notation key "NE" (not estimated) has been used for CH_4 emissions from gas/diesel oil and residual fuel oil in marine bunkers. CH_4 and N_2O emissions from jet kerosene in aviation bunkers have also not been estimated. The ERT encourages France to try to estimate these emissions. In response to the draft of this report the Party indicated that up to now, these pollutants were not estimated for aviation, as far as methodologies from ICAO, CORINAIR and MEET, do not provide emission factors for these pollutant within detailed approaches. Nevertheless, simple approaches from CORINAIR provide rough estimation for them. Possible examination of inclusion of estimation of these GHG could be processed, but it will be too late for the next 2002 GHG inventory, because of time schedule constraint of validation process managed by the French Environment Ministry.

Feedstocks and non-energy use of fuels

27. In the NIR under table 1.A(d), the Party has indicated in the documentation box the quantities of emissions associated with non-energy use that have been included under 6.C Waste Incineration, 3.A, 3.B and 3.C Solvent and Other Product Use and 1.B.2 Fugitive Emissions from Oil and Gas. The ERT appreciates the effort made to supply this information but encourages France to provide more information on the details of the allocation in order to enhance transparency.

C. Key sources

Stationary combustion

28. Public electricity and heat production is a key source by both level and trend assessment. It contributed 5.2 per cent of total GHG emissions in 2001. There are approximately 150 installations that are individually surveyed each year to determine fuel consumption and fuel characteristics. To improve the transparency of the inventory, the ERT encourages France to provide the AD and EFs in the NIR.

29. For petroleum refining, information on fifteen installations is collected annually from Directions Régionales de l'Industrie, de la Recherche et de l'Environnement (DRIRE) and used directly in the inventory. However, the value of the CO_2 implied emission factor (IEF) for solid fuels used in petroleum refining is the highest of the reporting Parties. To improve the transparency of the inventory, the ERT

encourages France to provide the AD and EFs in the NIR, and verify the EFs for this particular source. The Party responded, to the draft of this report, that only one refinery uses this type of fuel and the associated CO_2 emissions are very low compared to CO_2 from all refineries.

Mobile combustion

30. CO_2 in road transport is a key source by trend and level assessment. It contributed 23.4 per cent of total national GHG emissions in 2001 and has increased by 18 per cent since 1990. The methodologies and EFs are either CORINAIR or country-specific. The information provided on the methodologies in the NIR is insufficient to provide complete transparency. However, the ERT noted that the Party has plans for a more precise description of the methodologies in the next NIR. In its response to the draft of this report France explained that the methodologies and EFs are from the CORINAIR/COPERT emission model, but that the inputs for the model are country-specific based (vehicle fleet, traffic conditions, annual mileages, etc.).

Fugitive emissions

31. For mining activities of surface mines (1.B.1.a), the IEF for CH_4 is much higher than that for other countries. The ERT encourages France to verify the EFs for this activity. In response to the draft of this report France explained that emissions from the item "mining activities" include emissions from "mining activities" and emissions from "post-mining activities". As emissions from "post-mining activities" are included in the item "mining activities", and as the activity data of this item is related only to "mining activities", the calculated EF is high.

III. INDUSTRIAL PROCESSES AND SOLVENT USE

A. Sector overview

32. In 2001, industrial process emissions accounted for 7.4 per cent of total CO_2 equivalent emissions (without LUCF), less than in the base year 1990 (10 per cent). CO_2 accounted for 44 per cent of the sector's emissions in 2001, N_2O (from nitric acid and adipic acid production) for 27 per cent, and actual emissions of fluorinated gases (F-gases) for 28 per cent (HFCs 20 per cent). In the period 1990–2001, CO_2 equivalent emissions in the sector fell by 24.8 per cent, mainly because of decreases of 21 per cent in CO_2 emissions from mineral production and about 50 per cent in N_2O emissions from adipic acid and nitric acid production (mainly as a result of a decrease in nitric acid production). This was partly compensated by an increase in F-gases, mainly due to the increase in emissions from ozone depleting substance (ODS) substitutes (e.g., HFCs +268 per cent). No potential emissions of F-gases were reported.

33. For the Industrial Processes sector, in addition to five key sources identified by the secretariat, the Party also identified CO_2 from lime production and from iron and steel production, N_2O from other chemical production, HFC-23 and PFCs from HCFC-22 and PFC manufacture, PFCs from aluminium production and SF_6 from semiconductor manufacture as key sources.

34. Recalculations were made for various sources for the complete time series (CO_2 from lime production; N_2O from nitric acid and glyoxylic acid manufacture; HFC-134a from foam blowing; and SF_6 from electrical equipment since 1996).

35. The transparency and comparability of the reporting of this technological sector could be improved by providing more detailed information on the CORINAIR methods and country-specific EFs. France has announced that in its next NIR it will report the corresponding IPCC tier to which the CORINAIR methodologies correspond. In cases where (I)EFs did change significantly over time, the ERT recommends France to provide in the NIR information that supports this trend.

36. In addition to the acknowledged sources of N_2O, France reports N_2O emissions from glyoxylic acid manufacture. According to the CRF completeness table, SF_6 emissions from various minor

applications are omitted, whereas the CRF overview table suggests that all SF_6 sources are reported. The ERT recommends France to correct this inconsistency. The Party in response to the draft of this report indicated that to be consistent, table 9 for completeness should mention that SF_6 emissions form various applications are not estimated due to negligible level of emissions.

B. Key sources

Cement production – CO_2

37. France explained that AD on clinker production are based on statistics provided by the French Cement Union, thereby differing from cement production reported by the UN.

Ammonia production – CO_2

38. France explained the different AD reported by the UN, which is caused by use of different units: full mass of ammonia (NH_3) is used in the CRF while the UN data show mass expressed as nitrogen (N).

Lime production – CO_2

39. Lime production and soil lime production are identified as key sources for which the EFs for CO_2 are reported as country-specific, but no reference to the data source has been provided, nor has the IEF been supplied.

Nitric acid production – N_2O

40. The NIR explains that production data have been revised for the years since 1996 and the emissions have been recalculated for all years since 1990. The ERT recommends that France explain why the recalculation represents an improvement, and that overall time series consistency be maintained or improved. In the methodological annex, France explains that in the chemical industry either production or capacity data were used. The ERT recommends the Party to explain in more detail in the NIR the exact nature of the AD used for the emission calculations, and to do this for other sources in the chemical industry as well. The Party responded, to the draft of this report, that CITEPA has improved the methodology to estimate the nitric acid production emissions by using specific information on activity data and N_2O emissions from producers. These emissions are estimated according to a "good practices guidance" approved by standardized rules (AFNOR).

Adipic acid production – N_2O

41. N_2O emissions decreased substantially as a result of control measures taken by the industry, in particular since 1997, and AD are reported to be confidential. The ERT therefore recommends France to explain in the NIR the nature of this decrease and to explain how the N_2O EFs for the years since 1997 were determined. Moreover, the ERT recommends that the Party describe whether source-specific QA/QC procedures in place comply with the IPCC good practice guidance, in particular since 1997 and the implementation of control measures. France in its response to the draft of this report explained that the decrease in N_2O emissions from adipic acid production since 1997 is due to the implementation of a treatment system that convert N_2O emissions into nitric acid. These emissions are estimated according to a "good practices guidance" approved by standardized rules (AFNOR).

Chemical industry / Other – N_2O

42. France reports process emissions of N_2O from glyoxylic production, whereas the IPCC Guidelines do not identify such a source of N_2O. The ERT encourages France to describe the nature of these emissions. The Party, in its response to the draft of this report, indicated that glyoxal (and therefore glyoxylic acid) is obtained from the reaction of acetaldehyde and nitric acid according to the equation $2CH_3CHO + 2HNO_3 \rightarrow 2HNO_3 + 2CHOCHO + N_2O + 3H_2O$. These emissions are estimated according to a "good practices guidance" approved by standardized rules (AFNOR).

Iron and steel industry – CO_2

43. The IEF for CO_2 has decreased substantially since 1990. The ERT recommends France to explain the changes and the decrease over time. The Party explained, in its response to the draft of this report, that the CO_2 emissions are calculated from the carbon balance based on energy consumption. The IEF is calculated by dividing emissions by production. The decreased CO_2 emission factor since 1990 is due to better energy efficiency and changes in fuel type used.

Aluminium production – PFCs and CO_2

44. The EFs for PFCs reported by the producer are higher than those reported by other Parties, and have decreased substantially between 1990 and 1995, and since 2000. According to the NIR this is due to the improvement of operating conditions. France explained that the Péchiney method was used for calculating the PFC emissions. The ERT recommends the Party to report whether the QA/QC procedures used by the producer to arrive at the plant-specific EF comply with the IPCC good practice guidance.

45. France explained the decrease in the IEF of CO_2 since 1997 by an agreement made in 1996 with the aluminium producer to reduce CO_2 emissions between 1996 and 2000.

Production of halocarbons and SF_6 – HFCs

46. Because of the introduction of control measures, emissions of HFC-23 decreased substantially between 1990 and 1995, and AD are reported to be confidential. The ERT recommends France to explain in the NIR the nature of this decrease and how the EFs were determined, and to describe whether the source-specific QA/QC procedures in place comply with the IPCC good practice guidance.

Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6

47. Potential emissions of F-gases are not reported. The ERT recommends that the Party provide information on potential emissions of all compounds involved to assist in the calculation and evaluation of P/A ratios, particularly for major uses of HFCs.

C. Non-key sources

Electrical equipment – SF_6

48. The NIR states that the consumption of SF_6 in this application has been recalculated since 1996. The ERT recommends that the Party explain why this recalculation represents an improvement, and that overall time series consistency be maintained or improved. The Party responded, to the draft of this report, that specific data on consumption of SF_6 for the manufacture of switchgears has been introduced in the inventory.

Solvent and other product use – CO_2

49. According to the NIR, CO_2 emissions due to solvent use are reported. However, no clear description is presented of how and where CO_2 related to other product use and to fossil fuel feedstock/non-energy use of fuels is accounted for. The ERT recommends that France explain in the NIR in which categories these emissions are reported, how the data are checked for completeness, and how double counting in the national inventory is avoided.

IV. AGRICULTURE

A. Sector overview

50. The Agriculture sector contributed 17.5 per cent of the total national CO_2 equivalent emissions in 2001. Between 1990 and 2001 emissions from the sector decreased by 6.1 per cent. The decline in emissions is largely driven by a decline in dairy cattle and sheep populations over this period.

51. Emission reporting in the CRF for the Agriculture sector is complete. However, gaps in the CRF are not filled in with the appropriate notation keys; these should be reported in all tables/cells. Prescribed Burning of Savannas (4.E) and Field Burning of Agricultural Residues (4.F) are reported as not occurring ("NO").

52. A mix of CORINAIR, IPCC default and country-specific methods are used to estimate emissions. The NIR provides some information, such as the correspondence between CORINAIR and IPCC classes, but does not provide sufficient information on the CORINAIR approach or the country-specific methods to enable a third party to repeat the calculations. There is also not sufficient information on the sources of AD and the level of disaggregation at which they are used to make it possible to estimate emissions. France is encouraged to revise the CRF table Summary 3 to better reflect where country-specific methods and IPCC default EFs are used. The Party is further encouraged to improve its documentation on methods and data used. France, in its response to the draft of this report, explained that it will improve its methodology for estimating emissions from agriculture by using IPCC tier 2 methodologies.

53. In response to the previous review recommendations, methods and AD have been changed, indirect emissions from agricultural soils have been included and CH_4 emissions from agricultural soils have been removed. Recalculations of previous inventories have been made. The changes have been applied appropriately across the time series and are explained in the NIR and the CRF. Quantitative estimates of uncertainty are provided, and the uncertainty reported on the AD and EFs appears reasonable.

B. Key sources

Enteric fermentation – CH_4

54. The CORINAIR methodology is used to estimate emissions from cattle. This approach produces IEFs that are comparable with the IPCC defaults for Western Europe. It is unclear if this model calculates emissions using a tier 2 approach or tier 1 methods. A brief description of the model in the NIR would assist transparency. In response to the draft of this report, France explained that the methodology is tier 2.

Manure management – CH_4

55. The information presented in table 4.B(a) appears to be based on the IPCC defaults, with the exception of non-dairy cattle volatile solids (VS) production. It is assumed that the factor is based on a country-specific methodology, although no details of the method are provided in the NIR. The resulting emissions are comparable with the IPCC defaults.

56. The IPCC default factors for temperate climates are used to estimate emissions. As some regions of France would be considered cold and some of the overseas territories may be considered warm, the ERT encourages France to separate the animals according to different climatic regions and calculate emissions using the appropriate climate region methane correction factor (MCF) or EFs. France responded to the draft of this report that the herd sizes in overseas territories are very small compared to the Metropolitan ones, but to improve the accuracy of the inventory France will use the emission factors for warm regions, for its overseas territories, in its next submission.

Direct emissions from agricultural soils – N_2O

57. France indicates that the IPCC default EF is used to estimate emissions from synthetic fertilizers. However, the IEF provided in the CRF (0.011 kg N_2O-N/kg N) is not the same as the IPCC default of 0.0125 kg N_2O-N/kg N. An IEF of 0.011 is also reported for animal waste applied to soils. The ERT encourages France to check the reported emissions and AD. In its response to the draft of this report France responded that emissions calculations are correct but to avoid misunderstanding it will change the reporting in the CRF so the EFs used are reflected correctly. This also will solve the problems mentioned in paragraph 58 below.

58. The quantity of animal waste nitrogen applied to soils reported is greater than the nitrogen reported in table 4.B(b) for non-pasture animal waste management system (AWMS) minus the 10 per cent fraction that volatizes as NH_3 and NO_X. France is encouraged to check the reported emissions and AD.

Animal production and other – N_2O

59. The documentation box explains that the difference between N reported for pasture range and paddock in table 4.B(b) and animal production in table 4.D is due to the overseas territories' emissions being reported separately. As no AD are reported for the overseas territories it is unclear if "Other" means animal production emissions only or if it includes other agricultural soils emissions. As France has not reported the overseas territories' emissions separately in any other source category, the ERT encourages the Party to report these emissions under the appropriate source categories rather than under "Other". This would improve the transparency of the inventory. If different EFs are used for the overseas territories this information should be reported in the NIR and the documentation box. The Party, in its response to the draft of this report, explained that it will improve the transparency for overseas territories in the next submission. However, it should be noted that emissions of animal production in the overseas territories are very small compared to the Metropolitan ones.

C. Non-key sources

Rice cultivation – CH_4

60. The rain-fed and deep-water rice production should be reported as "NO" in table 4.C.

V. LAND-USE CHANGE AND FORESTRY

A. Sector overview

61. The LUCF sector is a net sink, offsetting 66,370 Gg CO_2, or 10.5 per cent of France's total GHG emissions in 2001. The magnitude of this sink increased by 22 per cent during the period 1990–2001, although its contribution to national total has remained relatively constant, at 11–12 per cent, since 1993.

62. France has used country-specific methods and EFs for estimating emissions and removals in the LUCF sector. These are described in a document (CITEPA, 1999), which was made available to the ERT during the review.

63. In spite of observations made in previous reviews and synthesis and assessment (S&A) reports, the CRF tables have not been completed. Notation keys were generally not used to justify lack of reported data. Also, some inconsistencies were observed between the data in table 5 and the sectoral background data tables. France in its response to the draft of this report, stated that if the comment regarding the inconsistencies observed between data in table 5 and sectoral background data tables, refers to the total in table 5.D being different from the one in table 5, this has been corrected for the years 1999, 2000 and 2001.

B. Sink and source categories

Changes in forest and other woody biomass stocks

64. This is the category that contributes the most to CO_2 removal (152,206 Gg CO_2 in 2001), mainly thanks to an increase in the forest area (by 11 per cent from 1990 to 2001). Since France did not use IPCC procedure, the ERT encourages the Party to provide information on the calculations in the NIR in order to ensure transparency.

Forest and grassland conversion

65. Several inconsistencies were detected:

(a) Values of CO_2 emissions due to forest conversion for 2000 and 2001 are different from those corresponding to 1990, in spite of the fact that all reported parameters were the same. In its response to the draft of this report, France explained that due to lack of data, it considers that the same surface of forest is converted each year. However, the quantity of forest biomass per hectare is different each year, leading to different emissions. The explanation for the same value in 2000 and 2001 comes from the fact that statistics for 2001 for biomass density were not available on time for the preparation of the inventory;

(b) Reported values for net loss of biomass for both tropical (143 t dm/ha) and temperate (86 t dm/ha) forests are well below IPCC defaults;

(c) Emissions of CH_4 and N_2O by on-site burning of biomass seem to have been overestimated by three orders of magnitude.

66. The forest area converted per year is reported as remaining exactly the same over the period 1990–2001 (58,600 ha/yr in Metropolitan and 800 ha/yr in the overseas territories), which implies that 720,000 ha were converted over the 12-year period, or 5 per cent of the forest area in 1990. It is not clear whether this decrease in area was considered in the estimation of carbon removals by forests. Moreover, the Party reports an increase in forest area of 4.75 per cent during the same period. The Party responded to this observation, in its comments on the draft of this report, stating that the methodology for land use change will be modified during next year, to include recent statistics studies.

Other categories

67. Lack of information about methodologies and AD used also affects the transparency of reporting in the remaining categories (Abandonment of Managed Lands, CO_2 Emissions and Removals from Soil, and Other). Some problems detected were:

(a) It is not clear whether the reported value for removals due to abandonment of managed lands in tropical areas (48 Gg CO_2/yr) was derived using a country-specific method or the IPCC method;

(b) No indication of the source of values is shown in table 5 for emissions (6,646 Gg CO_2) and removals (–4,058 Gg CO_2) in mineral soils, since in background table 5.D only net emissions of 2,588 Gg CO_2 were reported;

(c) No information is provided on the processes (e.g., forest fires) causing non-CO_2 emissions from managed forests, or on the methods, AD and EFs used to determine them.

VI. WASTE

A. Sector overview

68. Emissions from the Waste sector contributed 2.5 per cent of total emissions (excluding LUCF) in 2001, compared to 2.6 per cent in 1990. Emissions of CH_4, the major GHG from this sector, increased by 27.6 per cent between 1990 and 1996 and then started to decline. In 2001, CH_4 emissions were about 0.2 per cent higher than in 1990.

69. All the CRF tables specific to the Waste sector contain data. Where data entries are not provided, as in tables 6.A and 6.C, notation keys have been used.

70. The CRF tables and the NIR provide a reasonable level of transparency in respect of inventory compilation and changes in the inventory from previous submissions. However, the ERT encourages France to provide detailed information on the methodologies used in the Waste sector in order to enhance transparency.

71. The methodologies used for estimating emissions from the Waste sector are described both in the CRF and in the NIR. New methodology has been applied to calculate CH_4 emissions from domestic and commercial waste-water handling in accordance with the IPCC good practice guidance.

72. Recalculations for the Waste sector are documented in tables 8(a) for the years 1990–2000, with corresponding explanations provided in table 8(b), and listed in the NIR.

73. Key source analysis is conducted using a tier 1 approach (both level and trend assessment). In 2001 there were two key sources: CH_4 emissions from solid waste disposal sites (SWDS) and CO_2 emissions from waste incineration.

74. QA/QC procedures and verification activities are described in the NIR. The estimates for all sources relevant to the Waste subcategories are considered to be of low or medium quality. No quantitative assessment of uncertainties is reported.

75. Compared to earlier submissions, France has improved its emission estimates from the Waste sector. This includes the use of the IPCC good practice guidance for calculating emissions from waste-water handling and updating parameters for the SWDS subcategory.

B. Key sources

Solid waste disposal sites – CH_4

76. Tier 2 methodology (first-order decay – FOD) has been used in line with the IPCC good practice guidance. Annual municipal solid waste (MSW) AD are obtained from a national survey. However, no data on the composition of waste are reported. The IEF value for managed waste disposal on land (0.01 t/t) is lower than those of other reporting Parties (0.01–0.23 t/t), and the IEF value for unmanaged waste disposal sites (0.47 t/t) is the highest among the reporting Parties (0.026–0.47 t/t). In the response to the draft of this report the Party indicated that the IEF value for managed waste disposal (that means "with compacting") is low due to flaring of biogas required by French legislation since 1997. For unmanaged waste disposal, due to the first order decay method and the decrease of the quantity of waste, the IEF is high.

C. Non-key sources

Waste-water handling – CH_4 and N_2O

77. Protein consumption (15 g N/person/day) is country-specific and seems too low when compared to the Food and Agriculture Organization (FAO) data. In response to the draft of this report the Party explained that the figures (15 g N/person/day) is not the protein consumption but mass of protein contained in human sewage. The figure for population (70 million people) seems too high compared to the World Bank information (59 million people). The Party has indicated to the ERT that the figure for population includes the discharges from industrial plants expressed in population equivalent.

Waste incineration – CO_2

78. EMEP/CORINAIR (SNAP 090201 and SNAP 090202) methodology has been used. Activity data were obtained from surveys conducted by Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), and the EFs used are country-specific, plant-specific (CITEPA) and from the EMEP/CORINAIR Guidebook. Waste incineration was a key source of GHG emissions in 2001. CO_2 emissions from incineration of biogenic waste are reported but not included in the national total. Emissions from waste incineration for energy recovery are reported in category 1.A.1.a.

ANNEX 1: MATERIALS USED DURING THE REVIEW

A. Support materials used during the review

2003 submission including CRF for years 2001 and an NIR.
2002 submission including CRF for years 2000
UNFCCC secretariat. "Report of the individual review of the greenhouse gas inventory of France submitted in the year 2001 (Desk review)." FCCC/WEB/IRI(1)2001/FRA (available at http://unfccc.int/program/mis/ghg/countrep/fradeskrev.pdf).
UNFCCC secretariat. "Report of the individual review of the greenhouse gas inventory of France submitted in the year 2001 (In-country review)." FCCC/WEB/IRI(2)2001/FRA (available at http://unfccc.int/program/mis/ghg/countrep/fraincountrep.pdf).
UNFCCC secretariat. "2003 Status report for France" (available at http://unfccc.int/program/mis/ghg/statrep03/fra03.pdf).
UNFCCC secretariat. "Synthesis and assessment report of the greenhouse gas inventories submitted in 2003. Part I." FCCC/WEB/SAI/2003 (available at http://unfccc.int/program/mis/ghg/s_a2003.html) and Part II – the section on France (unpublished).
UNFCCC secretariat. Review findings for France (unpublished).
UNFCCC secretariat. "Handbook for review of national GHG inventories." Draft 2003 (unpublished).
UNFCCC secretariat. "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 (available at http://www.unfccc.int/resource/docs/cop5/07.pdf).
UNFCCC secretariat. "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 secretariat. Database search tool – *Locator* (unpublished).
IPCC. *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000* (available at http://www.ipcc-nggip.iges.or.jp/public/gp/gpgaum.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).
IISI 2002. "World steel in figures." 2002 edition (available at http://www.worldsteel.org/media/wsif/wsif2002.pdf).

B. Additional materials

Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique (CITEPA) 1999. "Évaluation des puits de CO_2 suivant la nouvelle méthode préconisée par le GIEC. Rapport final." Convention No. 9/98, Réf. CITEPA 413g.

Responses to questions during the review were received from Mr. Jean-Pierre Chang (CITEPA) including additional material on the methodology and assumptions used.

- - - - -