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Report of the individual review of the greenhouse gas inventory of France submitted in 2005*

* In the symbol for this document, 2005 refers to the year in which the inventory was submitted, and not to the year of publication.

CONTENTS

I. Overview

A. Introduction

1. This report covers the centralized review of the 2005 greenhouse gas (GHG) inventory submission of France, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with decision 19/CP.8. The review took place from 10 to 15 October 2005 in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalists – Mr. Riccardo de Lauretis (Italy) and Mr. Tinus Pulles (the Netherlands); Energy – Mr. Simon Eggleston (United Kingdom of Great Britain and Northern Ireland), Mr. Tomas Gustafsson (Sweden) and Mr. Francis Yamba (Zambia); Industrial Processes – Ms. Maria Jose Lopez (Belgium) and Ms. Virginia Sena (Uruguay); Agriculture – Mr. Jorge Alvarez (Peru) and Ms. Britta Hoem (Norway); Land Use, Land-use Change and Forestry (LULUCF) – Mr. Sandro Federici (European Community) and Walter Oyhantçabal (Uruguay); Waste – Mr. Faouzi Ahmed Senhaj (Morocco) and Mr. Jose Villarin (Philippines). Mr. Tinus Pulles and Mr. Jose Villarin were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone and Mr. Javier Hanna (UNFCCC secretariat).

2. In accordance with the "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.

3. Comments indicating that the Party will consider the remarks made by the expert review team (ERT) in its future submissions are not specifically addressed in the revised report. In many comments, the Party provides explanations of issues, raised by the ERT in the draft review report. In such cases, the ERT leaves the relevant paragraphs unchanged since the ERT's recommendation to include such explanations in the national inventory report (NIR) and/or the so-called OMINEA report (OMINEA: Organisation et Méthodes des Inventaires Nationaux des Emissions Atmosphériques) is still valid. In many instances the Party indeed announces to include such explanations in the next submission.

B. Inventory submission and other sources of information

4. In its 2005 submission, France submitted a complete set of common reporting format (CRF) tables for the years 1990–2003 and a NIR. France has not reported on LULUCF using the reporting CRF tables for LULUCF as required by decision 13/CP.9 of the Conference of the Parties. Where needed, the 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 the annex to this report.

5. France states in the preamble to the NIR that its submission includes the OMINEA report. This report was not physically submitted with the CRF and NIR, but is available via the Internet. The version downloaded by the ERT during the review still indicates that this report is provisional ("provisoire"). The ERT recommends that France in future always submit a complete set of the documents that are part of its submissions in a physical form that cannot be changed (hard copy, CD-ROM or other permanent medium). By doing this, the OMINEA report can be seen as an annex to the NIR and its status will be completely clear. France informed in its comments to the draft review report that the methodological report OMINEA will be submitted in electronic format on CD-ROM together with the NIR.

C. Emission profiles and trends

6. In 2003, the most important GHG in France was carbon dioxide (CO_2), contributing 73.3 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by nitrous oxide (N_2O), 13.4 per cent, and methane (CH_4), 10.9 per cent. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 2.6 per cent of the overall GHG emissions in France. The largest contribution within this latter group comes from HFCs (2.0 per cent of total GHG emissions). The Energy sector accounted for 72.1 per cent of total GHG emissions, followed by Agriculture (17.6 per cent), Industrial Processes (7.5 per cent), Solvent and Other Product Use (0.2 per cent) and Waste (2.6 per cent). Total GHG emissions amounted to 557,169 Gg CO_2 equivalent, and decreased by 1.9 per cent between 1990 and 2003. The trends observed at the aggregated level do not show any unexpected features.

D. Key categories

7. France has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2005 submission. The analysis performed by the Party shows more detail but produced similar results when compared to the results of the key category analysis performed by the secretariat.[2]

E. Main findings

8. The ERT noted that France's NIR is concise and well-structured in terms of chapters, sections and paragraphs. However, in many places explanations of why particular emission factors (EFs) have been used or why specific recalculations have been performed are not provided. The NIR refers to the OMINEA report mentioned above, which is available for downloading (<http://www.citepa.org/publications/Inventaires.htm#inv6>). The ERT noted that this document does not provide values of some EFs used and is not complete. A plan to finalize the OMINEA report is mentioned in the NIR. The ERT recommends that the Party submit a final and complete copy of the OMINEA report to the secretariat in every GHG inventory submission.

9. Based on the information included in CRF summary table 3, the data are largely consistent with the information reported in the NIR, with some inconsistencies. In its response to earlier stages of the 2005 review, France announced that it would correct these inconsistencies in its next submission. The ERT welcomes this intention. Some examples are:

(a) The methodology used to estimate CH_4 and N_2O emissions from Transport is indicated as C/CS (CORINAIR/country-specific) in the CRF Summary table 3 and as C/CS/M (CORINAIR/country-specific/model) in the NIR;

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[1] In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO_2 equivalent excluding Land-use Change and Forestry, unless otherwise specified. France has not provided the tables of the common reporting format for LULUCF as required by decision 13/CP.9 using the land-use categories of the Intergovernmental Panel on Climate Change *Good Practice Guidance for Land Use, Land-use Change and Forestry*. Instead it has used the common reporting format tables for Land-use Change and Forestry as contained in the CRF adopted by decision 18/CP.8, which are based on the categories of the Intergovernmental Panel on Climate Change *Revised 1996 Guidelines for National Greenhouse Gas Inventories.*

[2] The secretariat identified, for each individual Party, those source categories which are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the Intergovernmental Panel on Climate Change *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.* Key categories 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 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.

(b) The methodology and EFs used to estimate CO_2 emissions under Other (Industrial Processes) are indicated in the NIR as CS (country-specific); however, they are not indicated in the CRF;

(c) The methodology used to estimate CH_4 emissions from Enteric Fermentation is indicated as C (CORINAIR) in the CRF and as Intergovernmental Panel on Climate Change (IPCC) T1/M (tier 1/model) in the NIR.

10. France addressed a number of the findings of previous 2005 review stages regarding implied emission factors (IEFs) and trends that were identified as outliers, by confirming the correctness of the raised issue. The ERT noted that in many cases only general explanations, if any, were provided. The ERT recommends that the Party facilitate the inventory review process by fully explaining the issues raised and solve any potential problems as far as possible during the early stages of the annual reviews.

11. The French inventory covers the metropolitan area (the European part of France) as well as all overseas territories. The NIR acknowledges that there are small differences in territorial coverage between the Convention and its Kyoto Protocol. Since this report is submitted under the Convention, the ERT recommends that France report following the coverage under the Convention.

F. Cross-cutting topics

1. Completeness

12. France has provided inventory data for the years 1990–2003. The ERT noted that in a number of tables France leaves data cells empty. They should all be completed either with numerical data or with the appropriate notation key. Examples are given in the sectoral sections of this report. In some tables (4.E, 4.F) France has used notation keys in the documentation box but not in the data fields. In order to increase comparability and to facilitate review, the ERT recommends that the Party report all quantitative information (with numerical data or the notation keys) in the relevant data fields of the CRF tables, and use the documentation boxes for information and explanations only. France informed in its comments to the draft review report that in future submission using the CRF Reporter, it will not leave data cells empty and will use the required notation keys.

13. France has not provided the LULUCF CRF reporting tables as required by decision 13/CP.9. The ERT was informed that the necessary data flow and methods are not yet in place. The ERT noted that France plans to make all the necessary arrangements in 2005 and intends to include the LULUCF CRF reporting tables in its 2006 submission.

14. Table 9 – Completeness has not been provided, and table 10 – Trends (1990–2003) has been provided in the CRF file for the year 2003 only. The notation keys “included elsewhere” (“IE”) and “not estimated” (“NE”) have been used in the CRF tables; however, no entries are provided in table 9. France informed in its comments to the draft review report that it will take care of completing table 9 with needed information on notation keys used in the CRF tables.

2. Transparency

15. In all sectors, the ERT encountered severe problems in reviewing the methodology and EFs used. The ERT recommends that the Party improve its referencing of methods and EFs, for example, by referencing the page and table number in the background documents where the relevant information can be found. France informed in its comments to the draft review report that references will be introduced where it will be possible and relevant to facilitate the ERT’s work.

3. Recalculations and time-series consistency

16. The ERT noted that recalculations of the time series 1990–2003 have been undertaken in order to take into account updated activity data (AD), new EFs and changes to other parameters. The recalculations result in an increase in the estimates of total GHG emissions of 0.6 per cent in base year (1990) and a decrease of 0.1 per cent in 2002. For 2002, major changes include: in relative terms, a decrease in the estimates of CH_4 emissions from the Chemical Industry by two orders of magnitude (99.8 per cent) and a decrease of CH_4 emissions from Energy Industries by a factor of four (80.4 per cent); and in absolute terms an increase by 3,544 Gg CO_2 equivalent in the estimates of N_2O emissions in Manure Management, and a number of updates for CO_2 within the Energy sector, totalling 2,794 Gg CO_2 equivalent. The first and second are a significant changes for the source category but insignificant for the national total; the third and fourth are small changes in large source categories with a significant impact at the national total. The ERT noted that the rationale for these recalculations is provided in the NIR, but not always with sufficient information. The ERT recommends that France provide more detailed information on recalculations in its 2006 submission.

4. Uncertainties

17. The NIR states that an IPCC tier 1 uncertainty analysis has been performed, and the results of this analysis are presented, both at a summary level and at the individual source category level. The total level uncertainty in 2003 is 18.8 per cent, while the uncertainty in the trend is 2.6 per cent. The high total uncertainty in France as compared to the level of uncertainty reported by other Parties is caused by the relatively low emissions from power plants (because of the high proportion of nuclear energy in total energy production in France). The activity which contributes most to the level uncertainty is N_2O from Agricultural Soils (20 per cent), due to the high share of this source in total GHG emissions (9.0 per cent). The ERT acknowledges the efforts made by France to quantify the uncertainty of the EF for this source. This, however, is an intrinsically uncertain source, the estimation of which is difficult to improve. The ERT recommends that France explain this in the NIR.

5. Verification and quality assurance/quality control approaches

18. France's quality management system is certified according to ISO 9001, version 2000. The agency responsible for the compilation of the inventory, the Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique (CITEPA), was certified according to ISO 9001 in 2004. A quality management system is in place including quality assurance/quality control (QA/QC) procedures, verification activities, and procedures for the formal approval of the GHG inventory.

6. Follow-up to previous reviews

19. The ERT noted that, following the recommendations of the previous (2004) review report, a QA/QC system has been established and is certified according to ISO 9001, while the other suggested improvements have not been implemented yet. In particular, the provision of more detailed descriptions of methodologies in the NIR using the structure given in the 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" (hereinafter referred to as the revised UNFCCC reporting guidelines), the implementation of a tier 2 key category analysis and the use of the notation keys consistently with the revised UNFCCC reporting guidelines still have to be implemented.

G. Areas for further improvement

1. Identified by the Party

20. The NIR identifies several areas for improvement:

(a) Finalization of the report on methodologies (the OMINEA report);

(b) Studies and further investigations to improve the accuracy of the estimates for key categories;

(c) The provision of better uncertainty estimates for key categories;

(d) Improvements to data collection and to the emissions estimates for sources with high uncertainties, such as the non-energy use of fossil fuels;

(e) The development of a new method to estimate and report LULUCF emissions following the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF).

2. Identified by the ERT

21. The ERT identifies the following cross-cutting issues for improvement. The Party should:

(a) Provide more detailed descriptions on methodologies in the NIR, using the structure given in the revised UNFCCC reporting guidelines. Descriptions of methodologies in the NIR can be complemented with relevant references to detailed information reported in the OMINEA report. The OMINEA report then needs to be completed and finalized;

(b) Use the notation keys in a way that is consistent with the revised UNFCCC reporting guidelines (i.e. all cells of the CRF tables for source/sink categories should contain a number or a notation key);

(c) Provide more detailed information in the NIR regarding recalculations (e.g. a comparison of the old and new estimates and the effects on the total GHG emissions at sectoral and national level);

(d) Consider the possibility of implementing a tier 2 key category analysis (linked with the improvement of uncertainty estimation). France informed in its comments to the draft review report that later it will study the possibility to implement tier 2 key category analysis together with the improvement of uncertainties estimation. The ERT recommends to implement these actions for the next submission.

22. Further improvements recommended by the ERT and relating to specific source/sink categories are presented in the relevant sector sections of this report.

II. Energy

A. Sector overview

23. In 2003, GHG emissions from the Energy sector in France amounted to 401,686 Gg CO_2 equivalent, or 72.1 per cent of total national GHG emissions. Total emissions from the sector had increased by 4.2 per cent compared to 1990, and increased by 1.4 per cent between 2002 and 2003. Between 1990 and 2003, CO_2 emissions from the Energy sector increased by 4.9 per cent, CH_4 emissions decreased by 40.8 per cent, and N_2O emissions increased by 67.8 per cent.

24. For the Energy sector, complete inventories and CRF tables have been submitted for the years 1990–2003, with the exception of information on the reference approach in tables 1.A(b), 1.A(c) and 1.A(d) for 2003. For the Energy sector, the methodology descriptions are included in the NIR and references are made to the OMINEA report.

25. Country-specific EFs have been used to obtain most of the emissions estimates, but default values from CORINAIR and EFs from models have also been applied. The ERT noted that some of these EFs are not explained in the NIR or in the OMINEA report and encourages France to include in the NIR tables the EFs used together with a description of the derivation of country-specific data. For example, the previous (2004) review found that a new CH_4 EF, based on a study conducted by CITEPA, had been used for wood burning. Recalculations had thus been performed, but relevant information was not included in the NIR or in the OMINEA report. The ERT recommends that the Party provide more information on why and how these EFs have changed.

26. The ERT noted that for several sources in the CRF no emissions of CH_4 and N_2O are estimated, although AD are available (e.g., CH_4 from other fuels in 2002 for 1.A.2.f (Other) under Manufacturing Industries and Construction). The ERT recommends that the Party provide estimates of these emissions in order to make the inventory more complete.

27. France reports in its CRF tables identical calorific values for coking coal, bituminous and sub-bituminous coal. The ERT recommends that the Party review these values and explain in the NIR whether and why this is appropriate.

28. The ERT noted strong inter-annual fluctuations in electricity generation from fossil fuels and related emissions. This was explained by the large fraction of electricity generated by nuclear and hydroelectric power, with fossil fuels making a variable contribution, dependent on variations in precipitation and winter temperatures. The ERT suggests that France provide explicit information on the share of fossil fuel-based and non-fossil fuel-based power generation in the country.

29. The ERT noted that in some cases a varying mix of fuels is reported as "other fuel", resulting in variations in the IEFs over the time series. The ERT recommends that the Party provide more detailed information on the subcategory level in terms of changes in fuel mix over time.

B. Reference and sectoral approaches

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

30. CO_2 emissions from fuel combustion have been calculated using the reference approach (except for the year 2003) and the sectoral approach. For the year 2002, there is a difference of –4.3 per cent in the CO_2 emissions estimates between the reference approach and the sectoral approach. Explanations are provided in the documentation box of CRF table 1.A(c). In addition, the NIR provides the results of a "simplified reference approach" calculation for the time series 1990–2003 and some explanations for the differences between the two approaches over the years. The ERT recommends that France provide figures for the reference approach for 2003 and the latest reported year in its next submission.

2. International bunker fuels

31. For most of the inventory years 1990–2003, the data on consumption in international aviation and international marine bunkers, as reported in CRF table 1.C, are lower than the International Energy Agency (IEA) figures, with differences of up to 30 per cent for gas/diesel oil used in international marine bunkers. The Party stated in its response to previous 2005 review stages that fuel consumption for aviation/marine bunkers is estimated differently in the national emissions inventory and in the data sent by France to the IEA, without providing further details. The ERT recommends that the Party provide further details on this discrepancy.

32. The ERT noted that some large inter-annual fluctuations occur in both the international and the domestic aviation estimates, which partly compensate for each other, since the sum of the two shows smaller fluctuations. The ERT recommends that the Party review the consistency and accuracy of the

split between fuel use in domestic and international aviation. In its response to the draft review report, France did provide this information. The ERT recommends that France include this in the next submission. Furthermore, France is recommended to report aviation gasoline and its associated emissions separately from jet fuel.

3. Feedstocks and non-energy use of fuels

33. In its 2005 submission, France has provided data on feedstocks and non-energy fuel use for all years except for the year 2003, for which the national energy balance was not available in time. The ERT recommends that France provide figures on feedstocks and non-energy fuel use for 2003 and the latest reported year in its next submission.

C. Key categories

1. Energy industries: Liquid – CO_2

34. The 2003 value of the CO_2 IEF (78.31 t/TJ) for Public Electricity and Heat Production was identified as an outlier. It is among the highest of reporting Parties (the range is 70.87–80.42 t/TJ). The Party states that this is caused by the national EF for heavy fuel. The ERT noted that in the OMINEA report the EF for CO_2 from heavy fuel ("Fioul lourd HTS/BTS/TBTS") is 79/78/77 t/TJ. The ERT recommends that the Party include in the NIR an explanation of how the CO_2 EFs are derived.

2. Energy industries: Other – CO_2

35. Over the period 1990–2003, the CO_2 IEFs for public electricity and heat production decreased by 3.6 per cent (they are 95.89 and 92.44 t/TJ, respectively). The fuel "Other" is composed of waste used in waste incinerators with energy recovery and a smaller quantity of other gas used by public electricity plants. The relative importance of these two sources changes over the years. As data on waste incinerated and other gases are not provided, the ERT was unable to review how emissions from these sources are estimated. The ERT recommends that emissions from waste incinerators with energy recovery be reported separately and not combined with other fuels.

3. Road transportation: Gasoline – N_2O

36. The IEFs for CO_2 from diesel oil for 1990 and 1992–2003 have been identified as outliers (ranging from 74.70 to 75.04 t/TJ). These IEFs are among the highest of reporting Parties and higher than the IPCC default value (74 t/TJ). The trend fluctuates. France stated during previous 2005 review stages that the calorific value for diesel oil for light-duty vehicles (42 GJ/t) is lower than the IPCC default value, and that the inter-annual changes in the IEFs are due to the rounding effect of the share of biogenic products used for diesel oil production. The ERT recommends that the Party discuss in its NIR the biogenic fraction of the diesel used as well as bio-fuel usage in France.

4. Fugitive emissions: Coal Mining and Handling – CH_4

37. The values of the IEF for CH_4 from Coal Mining and Handling – Underground Mines for 1995 and 1998–2003 (ranging from 24.43 to 39.02 kg/t) were identified as outliers. They are the highest of reporting Parties and higher than the IPCC default range (4.5–16.75 kg/t). Over the period 1990–2003, this IEF increased by 60.5 per cent. The trend fluctuates. The Party stated during previous 2005 review stages that its data derive from a national office. The ERT recommends that the Party explain these changes, as well as the high value, in its NIR.

38. Surface Mines category has a high variability in the IEF. The Party stated in its response to previous 2005 review stages that emissions of CH_4 occurred from 2002 onwards even though surface

mine activities ceased. France uses "fictitious" AD for those years. While this explains the trend, the ERT considers that it is not correct to enter fictitious data in the CRF.

D. Non-key categories

Road transportation: Natural gas – CO_2, CH_4 and N_2O

39. The NIR mentions the use of both compressed natural gas (CNG) and liquefied petroleum gas (LPG) as gaseous fuels in the category Road Transportation, whereas the CRF tables contain only emissions from use of LPG. In its response to the draft review report France informed that the use of CNG is very low and EFs are not available in the model used for estimating emissions in road transport (COPERT III). The ERT nevertheless recommends that the Party provide an estimate for AD and report "NE" for the related emissions from the use of CNG in road transport if EFs are not available.

III. Industrial Processes and Solvent and Other Product Use

A. Sector overview

40. In 2003, emissions from the Industrial Processes sector accounted for 7.5 per cent of total national GHG emissions – less than in the base year (1990) when the share was 10.1 per cent. In 1990 and 2003, the Solvent and Other Product Use sector accounted for 0.3 and 0.2 per cent of total national emissions, respectively. In 2003, CO_2 accounted for 43.9 per cent of emissions from the Industrial Processes sector, N_2O for 21.8 per cent (mainly from Nitric Acid Production and Adipic Acid Production), and actual emissions of fluorinated gases (F-gases) for 34.3 per cent (HFCs alone accounting for 27.4 per cent). In 2003, in the Solvent and Other Product Use sector, CO_2 accounted for 94.4 per cent of emissions (mainly from Paint Application and Other – Other Solvent/Product Use) and N_2O for 5.6 per cent (from Use of N_2O for Anaesthesia). In the period 1990–2003, GHG emissions from Industrial Processes sector decreased by 27.0 per cent, mainly because of decreases in CO_2 emissions from Mineral Products, Chemical Industry and Metal Production, and decreases in N_2O emissions from Adipic Acid production and Nitric Acid Production.

B. Key categories

1. Cement Production – CO_2

41. In the period 1990–2003, CO_2 emissions from Cement Production fell by 21.8 per cent following a decrease in production. Although CRF summary table 3 indicates that the CORINAIR method and a country-specific EF have been used, no explanation is provided either in the NIR or in the OMINEA report about the methodology used for estimating CO_2 emissions from cement production. Additionally, the CO_2 IEF (0.53 t/t) from 1990 to 2003 is higher than the IPCC default value (0.51 t/t). The ERT encourages France to explain the methodology used in order to improve the transparency of the estimates. The ERT also invites France to explain why clinker production decreased by 22 per cent between 1990 and 2003. In its response to the draft review report France provided this information. The ERT recommends including this information in the next submission.

2. Lime production – CO_2

42. The CO_2 IEF is 0.78 t/t from 1990 to 1997 and 0.77 t/t from 1998 to 2003. Emissions from the production of lime for use on-site (autoproducers) are excluded. France considers that these emissions are zero if lime is reused on site. The ERT recommends that France explain the fluctuation of the IEFs, include the production of lime by autoproducers (sugar mills, producers of steel, synthetic soda ash, calcium carbide, magnesia and magnesium metal, copper smelters etc.) in this category, and estimate CO_2

emissions accordingly. In its response to the draft review report France provided this information. The ERT recommends including this information in the next submission.

3. Ammonia production – CO_2

43. Over the period 1990–2003, the CO_2 IEFs decreased by 16.5 per cent (from 1.74 t/t in 1990 to 1.45 t/t in 2003). The 2003 value (1.45 t/t) is lower than the IPCC default range (1.5–1.6 t/t). No information is provided about the methodologies applied to estimate emissions from Ammonia Production either in the OMINEA report or in the NIR. The ERT encourages France to include in the NIR explanations of the methodology used to estimate emissions from Ammonia Production in order to improve the transparency of the estimates.

4. Adipic acid production – N_2O

44. Over the period 1990–2003, the N_2O IEFs decreased by 82.1 per cent. The 2003 value (0.09 t/t) is lower than the IPCC default value (0.3 t/t). France explained in its response to the previous 2005 review stages that this cannot be explained because the AD are confidential. The AD are expressed as an index (base year (1990) = 100). However, the ERT considers that reporting an index is not consistent with the revised UNFCCC reporting guidelines. The ERT recommends that France use the notation key "C" (confidential) for AD rather than using an index, in order to increase the transparency of the inventory and comparability with the inventories of other Parties.

5. Nitric acid production – N_2O

45. Over the period 1990–2003, N_2O emissions from this category decreased by 17.1 per cent. According to the OMINEA report (paragraph B.2.1.4.2.3), the data source used to estimate emissions from Nitric Acid Production changed in 2002. From 2002 onwards, emissions are estimated using data provided by the facilities. There is no information in both the NIR and the OMINEA report on the standards or methodologies used by the facilities or on the verification procedures applied by the Party. The ERT invites France to reference the methods used by the facilities to estimate emissions. Furthermore, the ERT invites France to assess the consistency of the time series (since the data source has changed) and to recalculate if necessary. In its response to the draft review report France provided this information. The ERT recommends including this information in the next submission.

6. Chemical industry: Other – CO_2, N_2O

46. Over the period 1990–2003, CO_2 emissions from Chemical Industry – Other decreased by 41.7 per cent. The emission trends over the period are unstable. France explained in its response to the previous 2005 review stages that this is due to improvements in the production process and to a decrease in production. The ERT considers that it is important to verify these trends and therefore encourages France to explain in the NIR the improvements that have been applied, the reasons for the evolution of the AD and the unstable trends.

47. Over the period 1990–2003, N_2O emissions from Chemical Industry – Other decreased by 62.4 per cent. The emission trends over the period are unstable. In its response to earlier stages of the 2005 review, the Party explained that the trend and the inter-annual fluctuations are mainly due to the introduction of abatement technology in individual plants (for adipic acid and glyoxylic acid). In the inventory this is approximated by using an index for the IEF. The ERT recommends that France use a more transparent method and link the changes in the EF directly to the abatement measures taken.

48. The ERT noted that N_2O emissions from ethylene are not reported and no notation key is provided, but AD are reported for 1990–2003. France indicated in its response to the previous 2005

review stages that the notation key "NO" (not occurring) should be reported here. The ERT recommends that France use "not applicable" ("NA") or not estimated ("NE") rather than "NO" for these emissions.

7. Iron and steel production – CO_2

49. CO_2 emissions from Iron and Steel Production decreased by 28.6 per cent from 1990 to 2003. The trend fluctuates. Moreover, the inter-annual changes in the IEFs for CO_2 from Steel and Pig Iron production have been identified as outliers. France explained during previous 2005 review stages that the CO_2 EFs are calculated on the basis of the annual "French Iron and Steel Federation energy and production assessment" and, depending on the facility the energy is allocated to, the EF increases or decreases (for example, if a lot of blast furnace gas is flared, the CO_2 EF increases). The ERT considers this approach as not transparent. The ERT encourages France to review and document the methodology and the EF used in order to improve the transparency of the inventory in this category.

50. CO_2 emissions for Sinter are reported as "IE" and those for Coke are reported as "NO". For Sinter, AD have been reported. The Party clarified during previous 2005 review stages that CO_2 from Sinter should be noted as "NE" instead of "IE". In its response to the draft review report France states that in fact "NO" should be used for Sinter. The ERT encourages France to clarify this issue and to correct this mistake and to estimate CO_2 emissions from Sinter in its future inventories.

8. Aluminium production – PFCs

51. The IEFs for perfluoromethane (CF_4) and perfluoroethane (C_2F_6) from Aluminium Production decreased substantially from 1990 to 2003. The 2003 values (0.22 kg/t for CF_4 and 0.02 kg/t for C_2F_6) are lower than the IPCC default ranges (0.31–0.7 kg/t for CF_4 and 0.04–0.17 kg/t for C_2F_6). Some of the inter-annual changes in both IEFs (between 1991 and 1993, between 1997 and 1999, and between 2000 and 2002) have been identified as outliers, and the trend fluctuates at the end of the time series. France explained in its response to the previous 2005 review stages that this is due to the fact that: emissions data are provided by the industries; and during the period 1990–2003, two sites closed and the others made improvements by implementing more efficient control of the anode effect. The ERT recommends that France provide more detailed information on the methodology and EFs used in the NIR.

9. Production of halocarbons and SF_6 – HFCs, PFCs and SF_6

52. Actual emissions of HFC-23 from production of HCFC-22 decreased by 85.1 per cent from 1990 to 2003. The trend is unusual and fluctuates. As AD for production of HCFC-22 are reported as confidential, the ERT was not able to assess the reasons for the fluctuations. The trend changes in emissions of HFC-125, HFC-134a and HFC-143a from Fugitive Emissions are unstable, and the inter-annual variations are very large. The Party has not provided information on this in the NIR. The Party explains in the NIR that HFC-23 by-product emissions and fugitive emissions of HFCs and PFCs have been reduced since 1992 with the installation of incinerators on the production sites. To improve the transparency of its reporting, the ERT recommends that France explain these fluctuations and provide more information about the methodologies applied.

53. The AD for for fugitive emissions of HFCs and PFCs are reported as confidential ("C"), but fugitive emissions of HFC-152a and perfluorobutane (C_4F_{10}) are reported as "0"from 1990 to 2003, and fugitive emissions of C_2F_6 are reported as "0" from 1997 to 2003. The Party clarified in its response to the previous 2005 review stages that, in 2003, there were no fugitive emissions of PFCs and HFC-152a. The ERT recommends that the Party use the appropriate notation keys.

10. Consumption of halocarbons and SF_6 – HFCs, PCFs, and SF_6

54. Only actual emissions are reported for HFCs, PFCs and SF_6, whereas potential emissions of F-gases are reported as "NE" for all years. In its response to the draft review report France informed that potential emissions are not reported by France because the data necessary are not completely available. The ERT stresses that the revised UNFCCC reporting guidelines require Parties to provide this information. The ERT encourages France to estimate the total potential emissions of halocarbons (by chemical) and SF_6 for all years.

C. Non-key categories

Chemical industry: Other – CH_4

55. CH_4 emissions from ethylene and styrene are not reported and the notation keys have not been used. However, AD are reported for 1990–2003. The Party clarified in its response to the previous 2005 review stages that the notation key "IE" should be inserted for ethylene and "NA" for styrene. The ERT recommends that France indicate where the CH_4 emissions from ethylene have been accounted for. In its response to the draft review report France provided this information. The ERT recommends including this information in the next submission.

IV. Agriculture

A. Sector overview

56. In 2003, the Agriculture sector in France accounted for 17.6 per cent of total national GHG emissions, reaching 97,960 Gg CO_2 equivalent. Over the period 1990–2003, emissions from the sector decreased by 9.1 per cent. In 2003, N_2O contributed 57.6 per cent to total sectoral emissions, and CH_4 accounted for the remaining 42.4 per cent. Agricultural Soils, Enteric Fermentation and Manure Management were the major source categories of the sector, contributing 51.2 per cent, 28.9 per cent and 19.8 per cent, respectively.

57. France has performed a tier 1 key category analysis in which the following six key categories were identified: Direct Emissions from Agricultural Soils – N_2O, Animal Production – N_2O, Indirect Emissions from Nitrogen Used in Agriculture – N_2O, Enteric Fermentation in Domestic Livestock – CH_4, and Manure Management – CH_4 and N_2O. This agrees with the key category analysis made by the secretariat. The ERT recommends that the Party improve its QC system for this sector, since several mistakes in the filling in of the CRF tables were noted by the ERT, for example, the reporting of incorrect AD for Animal Wastes Applied to Soils and Atmospheric Deposition in table 4.D.

B. Key categories

1. Enteric fermentation – CH_4

58. From the information provided in the NIR it was not clear to the ERT whether the EF used for Enteric Fermentation from Non-Dairy Cattle is the IPCC default EF or a country-specific EF calculated using the method from the Institut National de la Recherche Agronomique. The ERT recommends that the Party explain this more clearly in its 2006 submission.

59. The ERT recommends that the Party include the complete swine population, including piglets less than 20 kg in weight, in the CRF, as the appropriate AD for estimating CH_4 emissions from Swine. For Enteric Fermentation, the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) stipulate that the whole swine population should be used as AD in cases when the default EF is used. In its response to the draft review report,

France indicated that uses an EF applied only to sows mothers, considering that this one includes piglets. Also France assumes the emissions from piglets to be small and are therefore neglected in this submission to avoid an overestimation of emissions from this population. France is preparing a tier 2 approach in its next submission, where this assumption will be assessed.

2. Manure management – CH_4

60. Over the period 1990–2003, CH_4 emissions from Manure Management decreased by 7.2 per cent. The 1992 value of CH_4 emissions for Non-Dairy Cattle is 4.1 per cent lower than the 1991 value, and the population had decreased by 1.1 per cent between 1991 and 1992. In its response to the draft review report France provided this information. The ERT recommends that the Party include this explanation in the next submissions.

3. Agricultural soils – N_2O

61. The Party indicated in its response to the previous 2005 review stages that the data as shown in table 4.D for Animal Wastes Applied to Soils are wrong, leading to an overestimation of N_2O emissions, but that the reported estimate for total Direct Soil Emissions is correct. The ERT also noted an inconsistency between the amount of nitrogen (N) shown for Pasture Range and Paddock in table 4.B(b) and the amount used as AD in table 4.D. The ERT encourages the Party to correct the error and to explain more transparently how the emissions from the different sources connected to Agricultural Soils were calculated.

62. In estimating N_2O emissions from Crop Residue, the Party has used a country-specific method. The Party is recommended to report the $Frac_{NCRBF}$, $Frac_{NCRO}$ and $Frac_R$ used in this estimation, if applicable. Otherwise, the ERT recommends that the Party describe adequately in the NIR and in the CRF documentation boxes the country-specific method used in calculating N_2O from Crop Residue. In CRF table 4.B(b), the notation keys are not used. The ERT recommends that the Party use the notation keys in this table.

63. The 2004 review report stated that the EF for sewage sludge spreading was very high. This is also the case for the EF for 2003 given in the 2005 submission (0.02 kg N_2O-N/kg N compared to the IPCC default value 0.0125 kg N_2O-N/kg N). The ERT reiterates the recommendation that the Party describe in the NIR how this country-specific value is derived. The ERT also encourages the Party to specify in its next NIR the amounts of different kinds of synthetic fertilizer used. In its response to the draft review report France provided this information. The ERT recommends including this information in the next submission.

64. In the 2004 review report, the ERT recommended the Party to describe in the NIR how the emissions estimates of "Cultures without Fertilizers" and the estimates for the overseas territories were calculated. The Party has indicated in its response to previous 2005 review stages that improvements to the reporting of these emissions are planned for the 2006 submission.

V. Land Use, Land-use Change and Forestry

A. Sector overview

65. In 2003, the Land-use Change and Forestry (LUCF) sector was a net sink in France, removing 53,073 Gg of CO_2 from the atmosphere. This represents 9.4 per cent of total national GHG emissions. France also reports emissions and "removals" of CH_4 and emissions of N_2O from the LUCF sector. The ERT noted that removals of CO_2 have increased significantly over time. In 1990, they accounted for 32,668 Gg CO_2, so that there was a 62.5 per cent increase in removals between 1990 and 2003. The increase is mainly accounted for by the category Changes in Forest and Other Woody Biomass Stocks.

66. France has not provided the CRF tables for LULUCF as required by decision 13/CP.9. Thus, background data are reported in the CRF tables for LUCF, which are based on the categories of the Revised 1996 IPCC Guidelines. Consequently, France's inventory in the LUCF sector cannot be considered complete. Moreover, there are specific problems: in 2003, a removal of 48 Gg CO_2 from tropical forest is reported under Abandonment of Managed Lands in table 5, but table 5.C does not show how this value has been derived; in 2003, a single value of net changes in soil carbon in mineral soils (768 Gg CO_2) is reported in table 5.D under Cultivation of Mineral Soils for all soil types, but the corresponding AD are not provided. The ERT recommends that France submit the reporting CRF tables for LULUCF, as requested by decision 13/CP.9, in its next submission.

67. According to the LULUCF section of the NIR, the OMINEA report contains a description of the methodologies used. However, the ERT was unable to find any information on the LUCF sector in this document. Reference to a report on methodologies (CITEPA, 1999) is made in the documentation boxes of the CRF, but the ERT was unable to find this document in freely accessible databases. The ERT concluded that the NIR does not provide any information about the AD, EFs and methodologies applied. This lack of descriptions causes a serious problem of transparency because France uses country-specific EFs and methodologies extensively. The ERT recommends that France include all relevant descriptions of methods, AD and EFs used in the NIR and also apply the IPCC good practice guidance for LULUCF to its estimates.

68. A problem of inconsistency of information was identified in category 5.E Other, where France reports a CH_4 "removal" of 31.1 Gg (in 2003) from "Managed Forests for CH_4 and non-methane volatile organic compounds (NMVOC)". However, the ERT noted that neither in the NIR nor in the Revised 1996 IPCC Guidelines is a consistent methodology provided. The ERT recommends that France apply the IPCC good practice guidance for LULUCF to its estimates and therefore not report such "removals" in its next submission.

69. Uncertainties are not covered in the relevant sections of the NIR, and no information on QA/QC is provided. The ERT recommends that France report such information in its next submission.

70. France informed in its comments to the draft review report that will apply the IPCC good practice guidance for LULUCF in the 2006 submission and that the methodology has been completely revised.

VI. Waste

A. Sector overview

71. In 2003, the Waste sector contributed 2.6 per cent of total national GHG emissions (compared to 2.7 per cent in 2002, and 2.8 per cent in 1990), with most of the sectoral emissions stemming from Solid Waste Disposal on Land (72.7 per cent). The categories Waste-water Handling and Waste Incineration contribute the remainder (respectively 17 and 10.3 per cent). Sectoral emissions decreased by 9.0 per cent between 1990 and 2003, with a peak in 1996 corresponding to an increase of 20.0 per cent compared to the 1990 level. The ERT noted that this change is largely due to a reduction in CH_4 emissions from landfills – by 8.0 per cent between 1990 and 2003.

72. All the sectoral CRF tables have been completed. In the few cases where data entries are not provided, the notation keys have been used. The Party's NIR is brief. The ERT recommends that the Party provide more detailed information on the methodologies, AD and EFs used in the Waste sector and to comment more exhaustively on the results.

73. The estimates for all relevant sources are reported to be of low or medium quality (CRF table 7). A quantitative assessment of uncertainties, calculated using the IPCC tier 1 method for the AD and EFs

of all Waste subcategories, is reported in the NIR table 28, but is not commented on or used in the NIR. The ERT recommends that the Party improve the uncertainties and elaborate on them in the NIR.

74. Recalculations have been performed to take into account the change in the AD and the CO_2 EF for industrial waste incineration for all years of the time series. The ERT recommends that the Party discuss the changes by sector in the NIR.

B. Key categories

1. Solid waste disposal on land – CH_4

75. In 2003, CH_4 emissions from Solid Waste Disposal on Land was identified as a key category on both the level and the trend assessment, and accounted for 17.0 per cent of total national CH_4 emissions and for 88.5 per cent of sectoral CH_4 emissions. The IPCC tier 2 method combined with country-specific parameters has been used to estimate CH_4 emissions from Solid Waste Disposal on Land. The OMINEA report which is referenced in the NIR does not contain information on the method used. The ERT recommends that France fill this gap in its next submission.

76. The data on municipal solid waste (MSW) have been generated from data on household waste (generation rate, composition). The ERT recommends that France show in its next NIR that these data do accurately reflect the characteristics of its MSW.

77. The amount of solid waste disposed on sites equipped with landfill gas recovery systems represents 84.0 per cent of total solid waste landfilled. Data on Solid Waste Disposal on Land are drawn from a survey carried out by the Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME). France is invited to provide in its next NIR the number and capacities of solid waste disposal sites both with and without landfill gas recovery systems.

2. Waste-water handling – CH_4

78. In 2003, CH_4 emissions from Waste-water Handling was identified as a key category on the trend assessment and accounted for 1.9 per cent of total CH_4 emissions and 10.0 per cent of sectoral CH_4 emissions.

79. Emissions are estimated only for waste water treated in centralized treatment units or in individual septic tanks. Industrial waste water is not accounted for because of lack of data. The ERT recommends that France fill this gap in its 2006 submission and to provide a clear flow diagram of the waste-water handling systems in the NIR. France stated in its comments to the draft review report that the methodology used only considers open anaerobic treatments and that these types of treatments are negligible in the industry. This will be explained in the next NIR/OMINEA report.

80. For these CH_4 (and N_2O) emissions estimates, France has used the IPCC tier 2 method combined with a country-specific one (CRF Summary table 3). The ERT recommends that France present and document the country-specific method used in the NIR. The ERT believes that the AD given in CRF table 6.B and the additional information boxes need to be better documented in order to improve the transparency of the inventory.

81. CH_4 recovery from Waste-water Handling is reported as "NE" in the CRF. France, in its response to the draft review report informed that it estimates only CH_4 emissions for open anaerobic treatments and CH_4 recovery does not occur in this type of treatment in France. The ERT recommends that this information will be clearly stated in the next NIR/OMINEA report and that the Party improve the use of notation keys.

3. Waste-water handling – N_2O

82. N_2O Emissions from Human Sewage have been estimated based on the nitrogen content of sewage per inhabitant. The method is not explained in the NIR to allow for verification. The ERT recommends that the Party provide the necessary data (e.g. protein intake, N fraction, population using septic systems, etc.) in its 2006 submission.

4. Waste incineration – CO_2

83. In 2003, CO_2 emissions from Waste Incineration were identified as a key category on the trend assessment and accounted for 0.3 per cent of total national CO_2 emissions.

84. It is reported in the NIR that emissions from the incineration of special industrial waste have been partially estimated. The ERT encourages France to provide AD of this subcategory of waste.

85. The CO_2 EF for industrial waste incineration has been updated, and recalculations have been performed accordingly. The ERT recommends that the Party report on the resulting changes.

C. Non-key categories

Other (biodegradation of waste and waste composting) – CH_4

86. Biodegradation of waste and waste composting are briefly reported in the NIR. The NIR does not contain information (AD, EFs, methods) on these waste treatments. The ERT recommends that this information be provided in the Party's 2006 submission.

Annex

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 secretariat. Status report for France. 2005. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/2005_status_report_france.pdf>.

UNFCCC secretariat. Synthesis and assessment report of the greenhouse gas inventories submitted in 2005. Part I: FCCC/WEB/SAI/2005. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/sa_2005_part_i_final.pdf>.

UNFCCC secretariat. France: Report of the individual review of the greenhouse gas inventory submitted in the year 2004. FCCC/WEB/IRI/2004/FRA. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/2004_irr_centralized_review_france.pdf>.

B. Additional information provided by the Party

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

CITEPA. OMINEA report, provisional version, March 2005. Available at <http://www.citepa.org/publications/Inventaires.htm#inv6>

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