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SPAIN

REPORT OF THE INDIVIDUAL REVIEW OF THE GREENHOUSE GAS INVENTORY SUBMITTED IN 2004[1]

I. OVERVIEW

A. Introduction

1. This report covers the desk review of the 2004 greenhouse gas (GHG) inventory submission of Spain, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with decision 19/CP.8 of the Conference of the Parties. The review took place from 8 to 26 November 2004 and was conducted by the following team of nominated experts from the roster of experts: Generalists – Mrs. Inga Konstantinaviciute (Lithuania) and Mrs. Anke Herold (European Community), Energy – Mr. Eilev Gjerald (Norway) and Mr. Yannis Sarafidis (Greece), Industrial Processes – Mr. Riccardo De Lauretis (Italy) and Mr. Marius Taranu (Moldova), Agriculture – Mr. Erda Lin (China) and Mr. Samuel Adeoye Adejuwon (Nigeria), Land-use Change and Forestry (LUCF) – Mr. Justin Ford-Robertson (New Zealand) and Mrs. Thelma Krug (Brazil), Waste – Mr. Takashi Morimoto (Japan) and Mr. Davor Vesligaj (Croatia). Mr. Samuel Adeoye Adejuwon and Mrs. Anke Herold were the lead reviewers. The review was coordinated by Mr. Javier Hanna (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 Spain, 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 2004 submission, Spain has submitted a complete set of common reporting format (CRF) tables for the years 1990–2002, and a national inventory report (NIR) in English and Spanish. Where needed the expert review team (ERT) also used previous years' submissions 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 2002, the most important GHG in Spain was carbon dioxide (CO_2), contributing 81.4 per cent to total[2] national GHG emissions expressed in CO_2 equivalent, followed by methane (CH_4) – 10.3 per cent – and nitrous oxide (N_2O) – 7.2 per cent. Perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) taken together contributed 1.1 per cent of total GHG emissions in the country. The Energy sector accounted for 78.1 per cent of total GHG emissions, followed by Agriculture (10.7 per cent), Industrial Processes (6.9 per cent), Waste (3.9 per cent) and Solvent and

[1] In the symbol for this document, 2004 refers to the year in which the inventory was submitted, and not to the year of publication.
[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.

Other Product Use (0.4 per cent). Total GHG emissions amounted to 399,731.53 Gg CO_2 equivalent and increased by 40.5 per cent from 1990 (base year) to 2002. Over the period 1990–2002, CO_2 emissions increased by 44.8 per cent, CH_4 emissions by 36.0 per cent, N_2O emissions by 9.4 per cent, HFC emissions by 62.1 per cent and SF_6 emissions by 328.2 per cent. The only GHGs with a declining trend over the period 1990–2002 are the PFCs, emissions of which decreased by 69.0 per cent. The increases in GHG emissions over the period 1990–2002 occurred in the Energy sector (46.2 per cent), Industrial Processes (20.4 per cent), Solvent and Other Product Use (27.3 per cent), Agriculture (14.1 per cent) and Waste (65.2 per cent). Net CO_2 removals from LUCF amounted to 10.8 per cent of CO_2 emissions from other sectors in 2002. Net removals from LUCF increased by 273.3 per cent between 1990 and 2002.

D. Key sources

5. Spain has reported a tier 1 key source analysis, both level and trend assessment, as part of its 2004 submission. It has chosen a higher disaggregation of source categories in the Energy sector than the analysis performed by the UNFCCC secretariat[3]. Spain's key source analysis and the UNFCCC analysis are generally consistent, with some minor exceptions: for example, Spain did not identify N_2O from Waste-water Handling and CO_2 from Waste Incineration as key sources in the trend analysis for 2002, which were identified as key in the secretariat's analysis.

6. The ERT recommends that Spain also perform a tier 2 key source analysis for its next inventory submission as the prerequisite for doing so – the quantitative uncertainty assessment – seems almost to have been completed.

E. Main findings

7. The ERT acknowledges the efforts undertaken by Spain to improve the quality of its national reporting through the NIR and CRF, as well as the further progress it has made towards implementing the *1996 Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) in preparing the preparation. However, the IPCC good practice guidance is not yet fully implemented, in particular as regards the putting in place of a quality assurance/quality control (QA/QC) system and documenting it in the NIR. A tier 1 uncertainty assessment has been undertaken for 2000 and 2001, but not yet for the base year (1990). The ERT encourages Spain to complete the implementation of the IPCC good practice guidance in its 2005 submission.

8. The Party itself had identified major areas for improvement at the more general and sectoral levels of the inventory during the previous (2003) in-country review and already has a fairly comprehensive overview of the problems and weaknesses. A number of the problems have been resolved with the 2004 submission (see the sector-specific sections below); the ERT welcomes this and expects that action to deal with the outstanding issues will be reflected in the 2005 inventory submission. In addition, the ERT recommends that Spain develop an inventory improvement plan as part of the QA/QC system in which all areas for improvement are clearly documented, as well as responsibilities, ways of resolving the outstanding issues and timelines for implementing the planned improvements, and that it document the main parts of this plan in the NIR.

9. The implementation of improvements would be more transparently reported if Spain could report section 10 of the NIR, where responses to the recommendations of previous reviews should be presented. The main outstanding improvements are the provision of more detailed information on methodologies,

[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.

activity data (AD) and emission factors (EFs) in the NIR and the provision of quantitative uncertainties for 2000 and 2001.

F. Cross-cutting topics

Completeness

10. In general, the inventory covers all years, gases and sectors, and most source categories, and is complete with regard to geographical coverage. Comparing the 2004 inventory submission with the 2003 inventory submission, the same source categories as in 2003 have not been estimated: the estimates of emissions and removals in the LUCF sector are incomplete, and categories Forest and Grassland Conversion, Abandonment of Managed Lands, and CO_2 Emissions and Removals from Soil have not been estimated. In the Energy sector, CO_2 emissions from Coal Mining and Handling, CO_2 and CH_4 emissions from Venting, CO_2 and CH_4 emissions from oil and natural gas Exploration, and CO_2 and CH_4 emissions from Other Leakage of natural gas have not been estimated. In the Industrial Processes sector, potential emissions of PFCs, HFCs and SF_6 are not estimated because of lack of the required data, nor are emissions from Limestone and Dolomite Use, Asphalt Roofing and Road Paving with Asphalt, or CH_4 emissions from Ethylene, Dichloroethylene and Styrene production. In the Waste sector, emissions from the incineration of industrial waste, where energy is not recovered from this waste stream, are not estimated. In addition, other minor subcategories are reported as "not estimated" ("NE"), as explained in the sectoral sections of this report below. The ERT recommends that Spain estimate emissions of all source categories that are not yet estimated, in particular those categories that may not be negligible. In its response to the draft review report, the Party informed that the 2005 inventory submission will include estimated of emissions of some categories not estimated in previous submissions; namely: i) emissions from Limestone and Dolomite Use; ii) CH_4 from Ethylene production; and iii) CH_4 emissions from Styrene production.

11. The use of the notations keys has improved but is still not completely correct: in some CRF tables a number cells are still left blank. Moreover, in some cases "0.0" seems to be used where emissions were either not estimated or not occurring ("NO"). The ERT encourages Spain to further improve the use of the notation keys and the presentation of additional information in the CRF.

Transparency

12. The NIR includes information on key sources, methods, assumptions, data sources, AD, EFs, recalculations and uncertainty assessment. The NIR has improved considerably compared with the 2003 submission, in particular in the description of methods, assumptions and data sources used for the estimation. However, the NIR does not follow the structure outlined in the UNFCCC reporting guidelines, although in general it contains the main elements proposed in this structure. The ERT welcomes Spain's effort to include in the NIR the information previously supplied in a methodological supplement (in Spanish). The missing elements are the sections on "Institutional arrangements" and the "Process of inventory preparation", the section on the "QA/QC plan" and section 10 on "Improvements resulting from previous reviews". Descriptions of emission trends (aggregated by gas and by sector) are provided in section 5, but the descriptions in some sectors do not include reasons or explanations for the developments in trends. The descriptions of the source categories are not yet structured in accordance with the UNFCCC reporting guidelines (clearly separating description, methodological issues, uncertainties, source-specific QA/QC, recalculations and improvements). In addition, the NIR only describes key source categories and does not provide much methodological information on non-key sources. The ERT recognizes that key sources should be prioritized in allocating resources, but recommends that Spain add brief methodological explanations for non-key categories to the NIR. In its response to the draft review report, the Party informed that some of the required information (e.g., QA/QC system, institutional arrangements) will be included in the 2005 inventory submission.

13. The 2003 review recommended that information on the data compilation activities of other government bodies (e.g., other ministries) should be included in the NIR, for example, the process by

which the Ministry of Economy compiles the national energy statistics. Such descriptions of institutional arrangements have not yet been included.

14. AD and implied emission factors (IEFs) for a number of source categories in the Industrial Processes sector (e.g., Soda Ash Production, Magnesite Production, Pig Iron Production, Aluminium Production and HCFC-22 Production) are reported as confidential. The 2003 review report recommended Spain to work to reduce the amount of confidential data, for example, to make estimates available at a disaggregated level for historical years (e.g., between three and five years ago) when production data have become less sensitive. In a few cases AD for single years are available (e.g., AD for Pig Iron and Aluminium Production for the year 2000), but for all other years the same AD are reported as confidential and it is unclear why the data for only one year are not confidential. Efforts should be undertaken to report at least historical years. For some years the respective production data are available from international statistics (e.g., for pig iron), so that it does not seem to be appropriate to report them as confidential for the entire time series. In its response to the draft review report, the Party informed that some action has been taken to reduce confidentiality restrictions concerning activity data from plants and that this could reduce the number of confidential cells of Industrial Processes tables for the next submissions.

15. No list of references to data sources or background documents is provided. This should be included in future NIRs and appropriately referenced in the sectoral descriptions.

Recalculations and time-series consistency

16. The ERT noted that the recalculations reported for the years 1990–2001 were undertaken to take into account updated statistics and new activity data, the elimination of errors, the revision of EFs, and the reallocations of emissions based on recommendations from the 2003 review report. A major revision of the methodology for estimating CO_2 has been conducted for coke plants using a full carbon (C)-content material balance. This is the recalculation which has the greatest impact on estimates of CO_2 emissions compared with the 2003 submission. The method for estimating net CO_2 uptake by forest trees has also been revised, implementing the recommendations of previous reviews, by using information from the Third National Forest Inventory, yearly time series for the period 1990–2000 and species-specific expansion factors, and avoiding double counting of forest fires. Emissions from Magnesite Production have been included for the first time in Spain's inventory submission.

17. Both the CRF and the NIR provide consistent explanations for the recalculations performed. The recalculations have improved the consistency of the time series and the reliability of the emissions estimates and trends. They have resulted in a downward revision of the estimates of total emissions for 1990 by 1.1 per cent excluding LUCF (an upward revision of 6.5 per cent including LUCF), while the estimates of total emissions for the year 2001 have been revised upwards by 0.2 per cent excluding LUCF (downwards by 0.4 per cent including LUCF), compared to the 2003 submission.

18. The information provided seems to be mostly consistent. The same methodologies and data sets are used for the base year and all subsequent years. However, because little information is available on the AD compiled by other ministries, it is possible that differences in the time series of data sets are not appropriately reflected and discussed in the NIR.

Uncertainties

19. A quantitative uncertainty assessment, as required by the IPCC good practice guidance, has been conducted for the first time in the inventory submitted in 2004 for the inventory years 2000 and 2001 (section 5.5 of the NIR). In CRF table 7, qualitative uncertainty estimates using the indicators high (H), medium (M) and low (L) are still provided, and section 3.5 of the NIR explains the qualitative uncertainty assessment without a link to section 5.5. The ERT welcomes the progress made regarding the uncertainty assessment and recommends that Spain complete the assessment for the base year. The ERT also welcomes the transparent description of the tier 1 uncertainty assessment conducted and the reporting of the results at a higher level of disaggregation than in CRF table 7.

Verification and quality assurance/quality control approaches

20. Spain does not report on QA/QC procedures applied, nor does it provide any information about a QA/QC plan or source-specific QA/QC activities. However, the 2003 review report showed that QA/QC activities are in fact performed, for example, checks for input errors and comparisons of time-series data for updated information, as well as source-specific QA/QC activities. The ERT recommends Spain to finalize the implementation of QA/QC procedures and to improve the documentation and reporting of QA/QC procedures performed at the general as well as at the sectoral level in the NIR of its next submission. In its response to the draft review report, the Party informed that the 2005 submission will include description of QA/QC activities.

21. The 2003 review report made a number of recommendations regarding institutional arrangements, for example, the intensification of cooperation with the other organizations that contribute AD in order to implement the IPCC good practice guidance by confirming that all organizations involved in the inventory preparation are following the required QA/QC procedures, consideration of the possibility of improving the legal basis for data supply, and the strengthening of the institutional arrangements for data supply. However, no activities regarding improved institutional arrangements are reported in the 2004 NIR. In the Energy sector, basic AD still come from international organizations such as EUROSTAT or the International Energy Agency (IEA), but not from the ministry that provides these data to the international institutions. No information is reported on progress with the organization of the national inventory database and the data flow, so that the ERT was not able to check how far previous recommendations have been implemented. The ERT recommends the Party to undertake these improvements (if it has not yet done so) and to report on them in its next inventory submission.

Follow-up to previous reviews

22. The ERT noted major improvements in this inventory submission compared to the 2003 submission with regard to the transparency and quantity of information, the tier 1 uncertainty assessment, the detailed description of recalculations performed and some methodological changes (e.g., for coke ovens), the inclusion of Magnesite Production and the reallocation of emissions to the appropriate source categories (e.g., emissions from incineration plants without energy recovery have been reallocated to category 6.C).

23. The ERT also noted, however, that some issues identified in previous reviews, such as the lack of documented QA/QC procedures or issues related to institutional arrangements, have not yet been addressed in the 2004 submission.

G. Areas for further improvement

Identified by the Party

24. During the 2003 in-country visit, Spain identified a large number of improvements to the inventory that should be envisaged in the future. The 2004 inventory submission does not clearly reflect these planned improvements and they should be undertaken and reported in Spain's future NIRs.

Identified by the ERT

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

(a) Complete the implementation of the IPCC good practice guidance;

(b) Estimate emissions of source categories that are not reported in the inventory in order to improve the degree of completeness – for example, emissions of HFCs and SF_6 from Semiconductor Manufacture; potential emissions of HFCs, PFCs and SF_6; CO_2 Emissions and Removals from Soil; and emissions of non-CO_2 gases in the LUCF sector;

(c) Further increase the transparency of its reporting, as indicated in the general and sectoral sections of this report;

(d) Provide more details about and precise descriptions of those methodologies that differ from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC Guidelines). References should be provided in the NIR to all methodologies, parameters and AD used;

(e) Reduce as far as possible the amount of data that are treated as confidential in the Industrial Processes sector.

II. ENERGY

A. Sector overview

26. In 2002, the Energy sector accounted for about 78.1 per cent of the total GHG emissions in Spain. Emissions from the sector had increased by 46.2 per cent since 1990 and there was an increase of 5.7 per cent from 2001. CO_2 emissions from the Energy sector accounted for 75.8 per cent of total national GHG emissions in 2002. The main contributing sources to total emissions from the sector in 2002 were Energy Industries (36.7 per cent), Transport (30.1 per cent), Manufacturing Industries and Construction (20.3 per cent) and Other Sectors (11.5 per cent). The Transport category is the sector with the highest growth in CO_2 emissions over the period 1990–2002, with an increase of 59.0 per cent. Next come Energy Industries (an increase of 46.3 per cent), Manufacturing Industries and Construction (an increase of 41.2 per cent) and Other Sectors (an increase of 32.2 per cent).

27. Emissions from the most relevant emission sources are included in the inventory. However, emissions from the following sources are not estimated: 1.A.3b Road Transportation (CO_2, CH_4 and N_2O from natural gas), 1.A.5 Other (CO_2, CH_4 and N_2O), 1.B.2.a Oil – Exploration (CO_2 and CH_4) and 1.B.2.b Natural Gas – Exploration (CO_2 and CH_4), 1.B.2.c Venting (CO_2 and CH_4) and 1.B.2.c Flaring – Oil (N_2O). The notation keys are not used at all times when they should be (e.g., in table 1.B1 and 1.B.2). It is unclear whether emissions from military activities are included in the GHG inventory at all or, if they are included, whether they are reported in the appropriate source category (e.g., 1.A.5). The ERT recommends the Party to report data from military activities in a more transparent way in its next submission.

28. The AD used in estimating GHG emissions for the Energy sector are based on the energy balance for Spain from IEA/EUROSTAT (according to the joint IEA/EUROSTAT questionnaires filled in by the Party) and national surveys. The Party itself does not produce an official national energy balance. This implies that the energy balance for the most recent year may not be available when GHG emissions are calculated. The ERT assumed that the lack of a national energy balance has only a limited influence on the quality of the national emissions data. However, the connection between the energy balance from IEA and the AD used in the inventory was not entirely clear to the ERT. For some sources the AD used in calculating emissions are based on AD from the IEA energy balance, for example, 1.A.1c Manufacture of Solid Fuels and Other Energy Industries, where some AD "were collected by means of individual questionnaires to the plants carrying out these activities. For the remaining activities in this category, including the coke plants not included above, the information has been based on the data from the International Energy Agency" (see chapter 7.1 Energy in the NIR). The AD used for calculating emissions from Road Transportation are from IEA, EUROSTAT and the Sub-Directorate General for Hydrocarbons at the Spanish Ministry of Economy. Again, the connections between the data from the different data sources need to be clarified. The ERT recommends the Party to explain how the national energy balance from IEA is compiled, since some of the AD used in the calculation are from that energy balance.

B. Reference and sectoral approaches

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

29. The difference between the CO_2 emissions calculated by the reference approach and by the sectoral approach is less than 2 per cent for most of the years 1990–2002, and the background for the

calculations and the differences between the two approaches are documented in detail in the NIR. The apparent consumption of fuels in the reference approach corresponds with the IEA data. The Party explains in the NIR and in its response to the 2004 previous review stages that the source for the energy data used in the reference approach is IEA, and EUROSTAT has been used for the years 1992 and 1993 because for these years EUROSTAT data were considered to be more appropriate. In its response to the draft review report, the Party explained that it revised the time series which is now in agreement with the IEA data.

International bunker fuels

30. The NIR explains that "the activity variable have been taken to be the fuel consumption figures appearing in the energy balance sheets as allocated to the respective international traffic flows: a) international marine bunkers; and b) international aviation, respectively". The ERT assumes that the energy balance mentioned is the one from IEA but no information is provided in the NIR on how the consumption of international marine and aviation bunker fuels has been estimated and separated from domestic consumption. The ERT recommends the Party to describe in detail how the amount of international bunker fuels used in the calculations is calculated by sampling.

Feedstocks and non-energy use of fuels

31. According to the NIR the amount of feedstocks and non-energy consumption of fuels is taken from the IEA energy balance. The ERT encourages the Party to provide further information on how these data are compiled.

C. Key sources

Energy industries: oil, coal, gas, other – CO_2

32. During the previous 2004 review stages the inter-annual changes in CO_2 emissions from all fuels between 1991 and 1992, 1995 and 1997, 1998 and 1999, and 2001 and 2002 were identified as outliers. The Party responded that it considers that the emissions reported are correct. However, the trend for CO_2 emissions from gaseous fuels in the energy industries fluctuates greatly (see table 1.17 in the 2004 synthesis and assessment (S&A) report Part I). In its response to the draft review report the Party explained that the trend of CO_2 emissions from gaseous fuels parallels very closely the trend of natural gas consumption in Energy Industries. The components influencing the trend are on one hand conventional power stations with a marked fluctuating pattern and a steady increase of use of new combined cycle gas turbines. The ERT recommends that the Party includes this information in the NIR and provides additional information on trends for the remaining fuels.

Public electricity and heat production: oil, other – CO_2

33. The 1991 CO_2 IEF value (80.48 t/TJ) for liquid fuels is identified as an outlier and the emission trend fluctuates during the period 1990–2002. The Party explained that this is due to lack of information about fuel characteristics in the period 1990–1993. It seems that the method for estimating this source has not been consistent over the period 1990–2002. The ERT encourages Spain to clarify this issue during the current process of verification of the entire time series. In its response to the draft review report Spain informed that the results of the revision and verification process will only be available for the 2006 inventory submission.

34. The trend of the CO_2 IEF for other fuels (waste) for this source category is unusual and unstable. The IEF (38.71 t/TJ) is constant over the period 1990–1995, but from 1995 to 2002 it decreased by 4.7 per cent (36.88 t/TJ). The Party explained that for some years the emissions reported are based on measured data while for other years they are based on calculation. The fluctuation in the IEF is due to variation in the net calorific value (NCV) of the waste. The ERT recommends the Party to give more detailed information about the method used in order to clarify whether the time series is consistent. The ERT also recommends the Party to provide references to the reported portion of 64 per cent biogenic and

36 per cent fossil carbon in incinerated waste. In its response to the draft review report, the Party indicated that the information on these fractions is currently revised.

Petroleum refining: gas – CO_2

35. The inter-annual changes in the CO_2 IEF for gas (between 1990 and 1992, 1993 and 1995, 1996 and 1998, and 1999 and 2002) are defined as outliers and the trend is unstable. From the Party's response to the 2004 previous review stages it was not quite clear to the ERT if the calculation method used is consistent for the whole time series. The ERT therefore recommends the Party to provide more information in the NIR regarding the calculation method used for this category.

Manufacturing industries and construction: oil, coal, gas – CO_2 and N_2O

36. The 2003 in-country review report commented that the IEFs for Non-Ferrous Metals and for all fuels are very high. The ERT at that time assumed that this was due to the fact that EFs per unit of manufactured product were used in the calculation instead of EFs per unit of fuel used. The units of manufactured product were then converted to energy use by applying specific ratios and a fixed allocation to fuel types. The situation is the same in the 2004 submission. The ERT again recommends the Party to review the assumptions underlying this approach.

37. The inter-annual changes in CO_2 emissions (from 1991 to 2002) and the CO_2 IEFs from liquid and solid fuels (from 1996 to 1997, 1998 to 1999, and 2000 to 2001) in the Chemicals sector were defined as outliers. The Party responded to this that the energy data for this source category will be improved in the 2005 inventory submission.

38. The N_2O IEF (12.18 kg/TJ) for liquid fuels for 2002 is still high compared to those reported by most countries. This situation was also commented upon during the 2003 in-country review, and the ERT encourages the Party to provide information on the choice of EF in its next submission. In the response to the review the Party informed that the N2O EF will be revised in the 2005 inventory submission.

Road transportation: oil – CO_2 and N_2O

39. The N_2O IEF (6.55 kg/TJ) for gasoline for 2002 is one of the lowest among reporting Parties, even though the value increased by 272.2 per cent from 1990 to 2002. The Party indicated in its response to the draft review report that the level and the increase in the rate of N_2O emissions reflect the level and rate of penetration of new vehicle technologies (COPERT III methodology). The ERT still recommends the Party to provide information on the choice of EF used in COPERT III model in its next submission.

40. The CO_2 EFs used for gasoline and diesel are 3.183 and 3.138 kg CO_2/kg, respectively. For most Parties the opposite situation is more common: the EF for diesel is higher than the EF for gasoline. The ERT recommends the Party to explain the reasons for this apparent deviation.

Navigation: oil – CO_2

41. In response to the 2004 previous review stages, the Party explained that the AD for liquid fuels used in the calculation are taken from IEA and the Association of Spanish Ship-owners (ANAVE). This raises the question whether the time series is consistent, and the ERT recommends Spain to provide further explanations on the compilation of fuel consumption.

Other sectors: coal, other – CO_2

42. For all source categories, AD and emissions for other fuels are reported as "NO". AD and emissions for solid fuels from Agriculture/Forestry/Fisheries are reported as "NO" (1992 and 1995–2002). The 1990, 1991, 1993 and 1994 values of the CO_2 IEF (119 t/TJ) for solid fuels for Agriculture/Forestry/ Fisheries are the highest of all reporting Parties. For some of these issues the Party explained that the data are taken from IEA/EUROSTAT or that IEA and EUROSTAT have no data for this sector. The Party indicated in its response to the draft review report that the EF used corresponds to sub-bituminous coal.

The ERT recommends the Party to carry out its own surveys if AD are lacking in this sector and to improve the consistency of the time series.

Fugitive emissions from solid fuels – CH_4

43. The AD for Coal Mining in 2002 are 28.7 per cent higher than the IEA data. The Party's explanation for this discrepancy is that the IEA data could be for saleable production while the CRF reports gross production. The ERT recommends the Party to provide a more definitive answer.

Fugitive emissions from oil and gas – CH_4

44. The CH_4 IEF (36,961.9 kg/PJ) for gas distribution in 2002 is among the lowest of all reporting Parties, and the CH_4 IEF (28,245.8 kg/PJ) for gas transmission in 2002 is low compared to those reported by other Parties and fluctuates over the period 1990–2002. In spite of the requirements of confidentiality, the Party should explain in detail the reasons for the low IEFs and the fluctuations. In its response to the draft review report the Party announced action to address this.

D. Non-key sources

45. The 2003 in-country review recommended the Party to update the AD for biomass since they were extrapolated from estimates for 1991 and 1995. It was not clear to the ERT whether this recalculation has been made, and the ERT considers that further information should be provided. In its response to the draft review report, Spain informed that complete time-series of biomass fuel consumption data are not yet available.

III. INDUSTRIAL PROCESSES AND SOLVENT USE

A. Sector overview

46. In 2002, the Industrial Processes and Solvent and Other Product Use sectors contributed 7.3 per cent (6.9 per cent and 0.4 per cent, respectively) to Spain's total GHG emissions. In 1990 the figures were 8.5 per cent (8.0 per cent and 0.5 per cent, respectively). Emissions from the two sectors taken together increased by 20.8 per cent from 1990 to 2002, but decreased by 2.4 per cent between 2001 and 2002. The trend of total emissions of the two sectors is strongly related to the emissions trend of the largest contributor of emissions in the Industrial Processes sector – Cement Production - although the reduction in emissions from 2000 to 2002 is also partly due to a reduction in HFC-23 emissions as a consequence of a decrease in production.

47. The CRF includes estimates of most gases and emission sources from the Industrial Processes sector, as recommended by the IPCC Guidelines. Minor sources have not been estimated: CO_2 emissions from Limestone and Dolomite Use, CO_2 emissions from Asphalt Roofing and from Road Paving with Asphalt, and CH_4 emissions from Ethylene, Dichloroethylene and Styrene production. Estimates of HFC, PFC and SF_6 emissions and time series from Refrigeration and Air Conditioning Equipment are calculated on the basis of an incomplete AD time series. Potential emissions of HFCs, PFCs and SF_6 have not been supplied, mainly because of the current lack of information on imports and exports per gas. In some cases the notation keys have not been used or have been used incorrectly. Moreover, CRF table 9 has not been filled in with information on sources not estimated. Spain is encouraged to provide emissions for the sources not estimated, to complete table 9, and to make use of the notation keys, as appropriate (for example, for Food and Drink, CO_2 emissions should be reported as "NO"). In its response to the draft review report, Spain informed that in the 2005 submission CO_2 emissions from Limestone and Dolomite Use will be estimated as well as CH_4 emissions from Ethylene and Styrene production. The Party also informed that some progress has been achieved in improving time series of activity data for Refrigeration and Air Conditioning equipment. In addition, Spain, as mentioned in the 2003 review report, is encouraged to develop a country-specific approach to collecting AD for the estimation of potential emissions of HFCs, PFCs and SF_6, to estimate emissions from semiconductor manufacturing, and to improve the estimation of HFCs, PFCs and SF_6 from Refrigeration and Air

Conditioning Equipment. Spain is further invited to specify the list of AD and related emissions of the processes included in Chemical Industry – Other.

48. Recalculations are reported for the whole time series 1990–2001. For all years the recalculated emissions for CO_2 are less than 2 per cent higher than those reported in the 2003 submission. For the other gases minor recalculations for 1995, 2000 and 2001 have been performed. In general the main reasons for the recalculations were improvements in AD, the elimination of double counting, and QC activities. Specifically, the most relevant recalculations concern CO_2 emissions from Mineral Products (due to the addition of emissions from Magnesite Production) and the revision of the AD for Glass Production, especially for 2000 and 2001. The recalculations have improved the accuracy and consistency of the estimates.

B. Key sources

Cement production – CO_2

49. The country-specific EF for CO_2, recommended by the Spanish Cement Producers Association, is higher than the IPCC default (0.54 t CO_2/t clinker and 0.507 t CO_2/t clinker, respectively). Responding to questions during the 2004 previous review stages, Spain reported that the mean content of lime (CaO) in clinker is around 66.4 per cent. This results in a theoretical ratio equal to 0.52 t CO_2/t clinker, but this ratio is further corrected with a factor of 1.035 to take into account amounts of CaO which do not come from carbonates and other oxides that come from carbonates. Spain is encouraged to continue its investigation of the reasons for the differences between the IPCC default and the national EF, which was started during the 2003 in-country review, and to report such explanations and references in the NIR.

Nitric acid production – N_2O

50. For 2002 the national estimates are higher than those reported by the United Nations (UN). Spain is encouraged to check this difference and to identify the data flow of activity data provided by the UN. During the 2003 review, the ERT recommended that Spain should establish direct contact with the production plants in order to verify the EF of 7 kg per tonne of production, but no further information has yet been provided in the NIR. In its response to the draft review report, Spain informed that AD has been taken from the Spanish Entrepreneurial Federation of Chemical Industries (FEIQUE) and that the N_2O EF has been taken from the report provided by FEIQUE to the Ministry of Science and Technology. The Party also informed that the referred EF factor will be checked with the production plants.

Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6

51. Consumption of halocarbons and SF_6 in Semiconductor Manufacture is reported as "NO", although the NIR states that Spain needs to further investigate whether emissions from this source category occur. Potential emissions of HFCs, PFCs and SF_6 have not been estimated because production, import and export data are available only for some subsectors and are not complete by individual gas species. Spain is encouraged to estimate and report potential emissions. The major problems in estimation concern the use of HFCs and PFCs in refrigeration. For this activity only a few plants answered the questionnaire collecting information, and data refer only to some years. The whole time series was calculated starting from this incomplete information. Spain should make its coverage of the sector and years more complete. A specific register for refrigeration appliances could be established involving local authorities and relevant ministries. This would improve the quality of the inventory considerably. Spain is encouraged to develop a register of refrigeration appliances.

Production of halocarbons and SF_6 – HFC-23

52. Activity data for all sub-source categories, including Production of HCFC-22, are reported as confidential for the entire time series. Spain informed that action has been taken with industry in order to remove the confidentiality restriction on production data. The considerable reduction in emissions over the last two years (2001 and 2002) was explained by the Party as being due to the introduction of a new system for recovery and storage of HCF-23 (implemented in one production plant). The HCF-23

recovered is then sent abroad for treatment. Spain is encouraged to report a time series at least of the average values of the process parameters in the NIR. The NIR should include general information on abatement technology used, as the recovery and storage are currently not mentioned. In addition, Spain should report whether the quality standards for measurement and verification of abatement efficiency described in the IPCC good practice guidance have been implemented.

Aluminium production – PFCs

53. Emissions of PFCs from Aluminium Production decreased by 76.9 per cent from 1990 to 2002. Emission estimates are based on detailed data supplied by industry. Activity data are reported as confidential because they refer to three plants of only one company. Spain informed that action has been taken with industry in order to remove the confidentiality restriction on production data. The reductions in emissions are mainly due to a reduction in the number of anode effects for cell day. Spain is encouraged to report a time series at least of the average values of the process parameters in the NIR. In addition Spain should report the information necessary to ensure transparency as provided by the IPCC good practice guidance for historical years (e.g., up to three or five years ago) as confidentiality concerns should be less relevant for historical years. In its response to the draft review report Spain informed that in the 2005 submission a Tier 2 method has been applied after a revision of the estimation procedure with the aluminium production company.

C. Non-key sources

Ammonia production – CO_2

54. In 2002 the CO_2 IEF reported (0.92 t CO_2/t ammonia) is lower than the IPCC default (1.5–1.6 t CO_2/t ammonia). The value is an average of the EFs provided by some ammonia-producing plants. Spain is encouraged to further investigate the possible causes of the difference and to provide supplementary referenced documentation. For 2002 the production data are higher than those reported by the UN. Spain is encouraged to investigate this difference as well and identify the data flow of figures provided by the UN.

Metal production – CO_2

55. Concerning Iron and Steel Production, sinter and coke emissions have not been reported, nor have the notation keys been used. Spain indicated that emissions from sinter plants are not estimated, and emissions from coke production are reported in both the fuel combustion- and fugitive emissions-related categories. The use of a more advanced tier for Iron and Steel Production emissions could improve the estimates, in particular with regard to the correct allocation of emissions to the Energy and Industrial Processes sectors. In its response to the draft review report, Spain informed that in the 2005 submission, AD for sinter production will be reported, and emissions originated from sinter production will be split between combustion and process source categories.

Solvent and Other Product Use – N_2O

56. N_2O emissions from solvent use other than for anaesthesia have not been reported, nor have the notation keys been used. Spain is encouraged to investigate the activities for which N_2O emissions should be estimated and to report the estimates correctly or use the notation keys. In its response to the draft review report Spain informed that in the 2005 submission notation keys will be introduced.

IV. AGRICULTURE

A. Sector overview

57. In 2002, emissions from the Agriculture sector accounted for 10.7 per cent of Spain's total GHG emissions. In 1990 the figure was 13.1 per cent. Emissions increased by 14.1 per cent between 1990 and 2002, mainly because of increasing CH_4 emissions from Enteric Fermentation, Manure Management and Rice Cultivation. In 2002, CH_4 emissions from Enteric Fermentation accounted for 34.5 per cent of total

GHG emissions from the sector, CH_4 and N_2O emissions from Manure Management for 24.1 per cent, and N_2O emissions from Agricultural Soils for 39.9 per cent.

58. The estimation of emissions in the sector is largely complete and the CRF tables have been completed, including the documentation boxes. No additional information is provided in CRF tables 4.A and 4.B(a), and no comparable estimation parameters are provided in the NIR. The ERT recommends Spain to add such parameters in either the CRF or the NIR (where this is more appropriate to the method used). Spain explained that no histosols are cultivated in the country and that therefore the use of the notation key "NO" for this source category is appropriate.

59. The ERT welcomes the considerable improvement that has been made to the NIR of the 2004 submission by describing the methods and parameters of emission sources in the Agriculture sector, for example, methodological descriptions, explanations of the differences between the AD used for the inventory and those published by the Food and Agriculture Organization of the United Nations (FAO) or detailed explanations of emission trends or changes in EFs. As Spain is using a rather complex data management system for the estimation of emissions from animal husbandry, the ERT considers that it would be useful to include a more detailed description of this system in an annex to the NIR. It would also be useful to include in the NIR some more (averaged) data, for example, disaggregated AD and other disaggregated estimation parameters, as currently logical explanations for trends are provided but most cannot be verified against the figures provided.

60. Recalculations in the sector (for CH_4 from Enteric Fermentation, CH_4 and N_2O from Manure Management, CH_4 from Rice Cultivation, N_2O from Agricultural Soils and N_2O from Field Burning of Agricultural Residues) are quantitatively minor and are explained in the CRF. They are due to the updating of AD and the correction of errors.

61. During the 2003 in-country review Spain explained that independent scientists were currently reviewing the methods used for calculating livestock emissions and that this review would define any improvements to be undertaken. The NIR should report the results of these peer review activities. In its response to the draft review report, Spain explained that this review will not be completed in the very near future and that the 2006 submission will potentially only include some results.

B. Key sources

Enteric fermentation – CH_4

62. The documentation of the methods and data used for this category has improved compared with the Party's previous submissions. No further information is provided as to whether more country-specific parameters were used in the estimation of significant animal categories. The NIR does not explain clearly which EFs were used in the estimation. Differences between some IEFs and IPCC default values were explained by the Party as being due to the use of a tier 2 method with country-specific EFs. The ERT recommends that the Party further improve its documentation of the methodologies and parameters used.

Manure management – CH_4

63. Spain has used a methane correction factor (MCF) that is temperature-dependent, thus avoiding jumps in the MCF between provinces where annual mean temperatures oscillate around 15°C (the temperature separating cool and temperate climates in the IPCC methodology). The 2003 in-country review report recommended that a methodological description be included in the annexes to the NIR, describing the procedures adopted to adjust the MCF for such temperature changes and their impact on the IEF in more detail. Such documentation has not yet been provided and the ERT encourages Spain to provide it in its next submission. Differences between some IEFs and the IPCC default values were explained by the Party as being due to the use of a tier 2 method with country-specific IEFs.

64. With respect to the different manure management systems, the NIR indicates that Spain uses a national methodology as it considers its national circumstances to be unique. However, neither a

description of these unique circumstances nor a description of the national method chosen is provided in the NIR.

Agricultural soils – N_2O

65. The estimated N_2O emissions from the Nitrogen (N)-fixing Crops source category remain constant for the periods 1990–1996 and 2000–2002 because AD for these periods are lacking. Spain announced that it intends to correct this problem in its next inventory submission.

66. The NIR explains that the activity data on the use of compost come from the Waste sector. However, neither the IPCC Guidelines nor the IPCC good practice guidance currently provide specific methods and default values for compost, and the ERT encourages Spain to provide further information on this issue. In its response to the draft review report, Spain explained that EF for direct emissions was used for compost emissions.

67. Further descriptions should be provided in the NIR to explain the choice of a $Frac_{LEACH}$ of 0.15 kg N/kg of fertilizer or manure N applied (the IPCC default value is 0.3, but the IPCC range is 0.1–0.8). In its response to the draft review report, Spain explained that national experts consider that due the small amount of rain in Spain the appropriate value could be 0.15 kg N/ kg of fertilizer or manure N applied which is within the IPCC range of values.

68. Spain reports "NO" for the category Cultivation of Histosols, while the Consejo Superior de Investigaciones Científicas and Instituto de Recursos Naturales y Agrobiologia de Sevilla (CSIC-IRNAS) reports a surface area of 214 km^2 for histosols, mainly along big rivers such as the Ebro (CSIC-IRNAS, 1999). "NE" would therefore be more correct. However, it would be preferable to provide a conservative estimate for carbon losses from this area instead of assuming that this soil type does not occur.

C. Non-key sources

Manure management – CH_4

69. In the case of non-significant animal categories estimated using the tier 1 method, 20 per cent has been subtracted from the IPCC default EF for young animals. However, the default value already takes into account an animal population with a certain age structure. Spain should explain why this subtraction does not lead to emissions being underestimated. In its response to the draft review report, Spain informed that it will revise the EF for the 2006 inventory submission.

V. LAND-USE CHANGE AND FORESTRY

A. Sector overview

70. In 2002, annual CO_2 removals by the LUCF sector amounted to 35,301.49 Gg, which represents an increase of 273.3 per cent over the period 1990–2002. In 2002, CO_2 removals from the sector offset 8.8 per cent of total national GHG emissions.

71. The main source of data used by Spain to report emissions and removals from the LUCF sector has been the Second National Forest Inventory (NFI). Data from the Third NFI were also available, providing more confidence in the estimates because the more recent data available. Interpolation from the Second NFI to the latest NFI was used.

72. Spain reports estimates under category 5.A Changes in Forest and Other Woody Biomass Stocks, but does not report any estimates under categories 5.B Forest and Grassland Conversion, 5.C Abandonment of Managed Lands or 5.D CO_2 Emissions and Removals from Soil (CO_2 emissions from soils are not reported in the Agriculture sector either). Spain indicates in the NIR that this is due to a lack of statistical data. Spain estimates that 5.B and 5.D are likely to be the more relevant categories, but notes that it is undertaking efforts to improve its inventory for the entire LUCF sector under the new IPCC Good Practice Guidance for Land Use, Land-use Change and Forestry (LULUCF).

73. The NIR provides a level of transparency that has not been evident in the Party's previous inventory submissions. Efforts have been made to demonstrate how new data have been incorporated in the LUCF sector.

74. In the review report of the 2003 inventory submission, the forest area was indicated as almost 14 Mha in 2001. This figure has been revised to over 18 Mha in the current inventory. It is unclear how or why the area has increased so dramatically, and the ERT is of the view that Spain should provide more explanation on this matter.

75. Constant annual net removals (29,252 Gg CO_2/yr) were reported in the 2003 inventory for the period 1990–2001. The 2004 inventory now shows an increasing trend, from 9,456 Gg CO_2 in 1990 to 31,477 Gg CO_2 in 2001 and to 35,301 Gg CO_2 in 2002. Very little is mentioned about this trend, such as the driving factors behind it or its sustainability, and the ERT is of the view that more information should be included in the Party's future NIRs.

B. Sink and source categories

Changes in forest and other woody biomass stocks – CO_2

76. Spain has adopted the recommendation of the 2003 review report that it review the carbon EF for harvested material. The factor provided in the IPCC Guidelines (0.45 t C/t dm) is now used.

77. The NIR explains that CO_2 emissions from forest fires are excluded because these losses are already accounted for in the Third NFI.

VI. WASTE

A. Sector overview

78. In 2002, emissions from the Waste sector amounted to 15,666.31 Gg CO_2 equivalent, or 3.9 per cent of total national GHG emissions. They increased by 65.2 per cent between 1990 and 2002. Emissions from Solid Waste Disposal on Land (a key source) represented 69.5 per cent of total sectoral emissions, while emissions from Wastewater Handling (a key source), Waste Incineration and the category Other (burning of waste at unmanaged solid waste disposal sites, industrial point sources waste-water handling and sludge spreading) contributed 22.5 per cent, 4.1 per cent and 3.9 per cent, respectively, to the sectoral total.

79. The NIR and the CRF include estimates of most gases and sources of emissions from the Waste sector, as recommended by the IPCC Guidelines. Only emissions from incineration of industrial waste have not been estimated because of difficulties in obtaining information on this activity. All the CRF tables have been completed for the period 1990–2002. The information provided in the additional information tables and documentation boxes of the CRF is complete for Solid Waste Disposal on Land, but in the case of Wastewater Handling and Waste Incineration the information provided is only partial. The ERT recommends Spain to complete its inventory and report this information in its future submissions. In the response to the draft review report, Spain informed that new information and explanations on Waste Incineration and Wastewater Handling will be included in the 2005 inventory submission.

80. The information provided in the NIR and the CRF is transparent but does not fully allow reconstruction of the emissions estimates since some underlying assumptions made by national experts are not fully elaborated in the NIR or the CRF. The NIR does provide documentary references to the main sources of information on AD and EFs.

81. The CRF provides recalculated estimates for CO_2 emissions from Waste Incineration due to the revision of the net heating value of steel plant furnace gas, and summarizes the changes made for the period 1990–2002.

B. Key sources

Solid waste disposal on land – CH_4

82. The first order decay (FOD) method was applied to estimate CH_4 emissions from solid waste disposal sites (SWDS). According to the CRF documentation box, the annual amount of municipal solid waste (MSW) landfilled in the period 1989–2002 was derived from an annual publication, *The Environment in Spain*. Until 1989, amounts of MSW were estimated by multiplying population data by a waste generation rate (tonnes of MSW/capita/yr). The NIR does not present historical data on amounts of waste landfilled. The ERT recommends Spain to provide historical data on amounts of waste landfilled and/or the underlying assumptions in order to improve transparency in its future NIR submissions.

83. The composition of landfilled waste in the period 1990–2002 was obtained from the annual publication *The Environment in Spain*, but the adjustments used for estimation (extrapolation, interpolation) reported in the CRF documentation box are not completely transparent. The ERT recommends Spain to provide an explanation of this in its future NIRs. In its response to the draft review report Spain informed that the NIR of the 2005 submission will explain that composition of MSW has been extrapolated for years in the interval 1984 to 1970 and interpolated for some years in the interval 1984–2003 to take into account the lagged CH_4 emissions.

84. The parameters used in the FOD model – degradable organic carbon (DOC), the fraction of degradable organic carbon dissimilated (DOC_F), the fraction of methane in landfill gas (F), and the methane oxidation factor (OX) – are mainly default values from the IPCC Guidelines and the IPCC good practice guidance.

85. For the methane generation rate constant (*k*), a value of 0.1 was used in calculation. This value gives a half-life of seven years, which is characteristic of a rapid degradation process as a result of high-moisture climatic conditions and rapidly degradable material. The ERT recommends Spain to provide additional information in the NIR on the assumptions used for calculating *k*. In the response to the draft review report, the Party explained that in the 2005 submission the values of the *k* and OX parameters will be changed to the default values suggested in the IPCC good practice guidance.

86. According to the CRF, CH_4 is recovered from five managed SWDS and the data on the amounts of CH_4 recovered are extracted from the publication *The Environment in Spain*. The ERT recommends Spain to provide data on CH_4 recovery in the NIR.

Waste-water handling – CH_4

87. This source category includes CH_4 emissions from domestic, commercial and industrial waste-water handling. The IPCC and EMEP/CORINAIR methodologies were applied to calculate CH_4 emissions from Domestic and Commercial Wastewater. The total amount of organic material in domestic and commercial waste water was estimated by means of population effectively served by the waste-water handling systems, and a domestic/commercial degradable organic component which equals 29,656 kg biochemical oxygen demand (BOD_5)/1000 persons/yr. This value is 60 per cent higher than the reference value provided in the IPCC Guidelines (18,250 kg BOD_5/1000 persons/yr). The ERT recommends Spain to elaborate on and justify the difference in its future NIRs. In its response to the draft review report, the Party explained that in the 2005 submission the BOD_5 parameter has been revised and the value used (21.9 kg/inhabitant-equivalent/year) is consistent with the IPCC default value.

88. The EFs for domestic/commercial waste-water and sludge handling were estimated using the IPCC default value for maximum methane producing capacity (Bo), which equals 0.6 kg CH_4/kg BOD, estimation of the fraction of waste water (WS) and sludge (SS) treated by the given handling system, which equal 1.0 and 0.85, respectively, and methane conversion factors (MCFs) for waste water and sludge which equal 0.005 and 0.3, respectively. The ERT recommends Spain to provide the rationale used by national experts in estimating these parameters.

89. The methodology applied for CH_4 emissions from industrial waste water is derived from the IPCC Guidelines for area sources which are reported in the CRF under category 6.B.1 Industrial Wastewater, and from EMEP/CORINAIR for point sources which are reported in the CRF under the category 6.B.3 Other (Other Point Sources – Industrial Wastewater). The AD for area sources were obtained from studies prepared by the Directorate General for Hydraulic Works and Water Quality at the Ministry of the Environment for the food industry in 1994, and for the chemical industry in 1996. In order to extrapolate time series, the industrial production index (IPI) produced by the Spanish National Statistics Institute was used. The AD for point sources were obtained from questionnaires. Further information on the methodology and the parameters used in calculating CH_4 emissions from Industrial Wastewater should be presented in Spain's future NIRs.

90. The information contained in CRF table 6.B is not complete in terms of additional information, and the analysis of Waste-water Handling provided in the NIR could be improved. Further information should be provided in the NIR related to total waste water, treated waste water, industrial waste water treated, domestic waste water treated, and the relation between aerobic and anaerobic handling systems.

C. Non-key sources

Waste incineration – CO_2, CH_4, N_2O

91. Emissions from waste incineration without energy recovery are reported in the Waste sector, while emissions from waste incineration with energy recovery are reported in the Energy sector, which is consistent with the IPCC Guidelines.

92. Amounts of incinerated waste of different type were obtained from the publication *The Environment in Spain*. Carbon content in waste and fraction of fossil carbon were used for calculating the EF for CO_2. According to the NIR, Spain estimates that 36 per cent of carbon is of fossil origin and that the carbon content of waste equals approximately 25 per cent. The ERT recommends Spain to provide the rationale used by national experts in estimating these parameters.

93. The EFs used for CH_4 and N_2O are taken from the EMEP/CORINAIR guidelines, but they are not provided in the NIR to allow comparison with the EFs in the IPCC Guidelines.

94. CH_4 and N_2O emissions from the open burning of agricultural residues are reported in the Waste sector (CO_2 emissions are reported as "0.00"). Neither the data sources nor the references for the AD and EFs applied for open burning of agricultural residues are provided in the CRF and the NIR and is not clear why these emissions are included in the Waste sector, as the Party also reports CH_4 and N_2O from Field Burning of Agricultural Residues under the Agriculture sector. The ERT recommends Spain to report emissions from open burning of agricultural residues in the Agriculture sector avoiding any double counting. In the response to the draft review report, the Party explained that CH_4 and N_2O emissions from the open burning of agricultural residues will be included in the Field Burning of Agricultural Residues category within the Agricultural sector in the 2005 inventory submission.

95. The amounts of steel plant furnace gas flared in the steel industry and IEFs are reported as confidential. The ERT recommends Spain to provide more background information on this matter.

ANNEX 1: MATERIALS USED DURING THE REVIEW

A. Support materials used during the review

2004 submission including a set of CRF tables for 1990–2002 and an NIR.

UNFCCC secretariat (2003). "Report of the individual review of the greenhouse gas inventory of Spain submitted in the year 2003"(In-country review)." FCCC/WEB/IRI(2)/2003/ESP (available on the secretariat web site <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/pdf/esprep03.pdf>).

UNFCCC secretariat. "2004 Status report for Spain" (available on the secretariat web site <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/spa04.pdf>).

UNFCCC secretariat. "Synthesis and assessment report of the greenhouse gas inventories submitted in 2004. Part I": FCCC/WEB/SAI/2004 (available on the secretariat web site <http://unfccc.int/program/mis/ghg/s_a2004.html>) and Part II – the section on *Spain* (unpublished). NB. This URL has changed with the redesign of the UNFCCC web site.

UNFCCC secretariat. "Handbook for review of national GHG inventories". Draft 2004 (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 on the secretariat web site <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 on the secretariat web site <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 on the following web site: <http:///www.ipcc-nggip.iges.or.jp/public/gp/english>).

IPCC/OECD/IEA. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories volumes 1–3, 1997* (available on the following web site: <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>).

B. Additional materials

Ministerio de Medio Ambiente de España (2003). Análisis por Actividades Emisoras de la Nomenclatura SNAP-97 y Correspondencia con Categorías CRF-IPCC/Inventario Nacional de Emisiones a la Atmósfera 1990–2001: Acidificadores, Precursores de Ozono y Gases de Efecto Invernadero.

Web page: FAO/AGLS Gateway Project: Gateway to national information on land, water and plant nutrition - Spain - Soil (containing CSIC-IRNAS, 1999, available at <http://leu.irnase.csic.es/fao/gateway/spain-e/e_soils.htm>.

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