COMPLIANCE COMMITTEE

CC/ERT/IRR/2007/14
8 November 2007

Report of the review of the initial report of Spain

Note by the secretariat

The report of the review of the initial report of Spain was published on 8 November 2007. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2), the report is considered received by the secretariat on the same date. This report, FCCC/IRR/2007/ESP, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the review of the initial report of Spain

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

CONTENTS

I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Spain, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 23 to 28 April 2007 in Madrid, Spain, and was conducted by the following team of nominated experts from the roster of experts: generalist – Ms. Anke Herold (European Community); energy – Ms. Branca Americano (Brazil); industrial processes – Mr. Riccardo de Lauretis (Italy); agriculture – Mr. Jorge Alvarez (Peru); land use, land-use change and forestry (LULUCF) – Mr. Aquiles Neuenschwander (Chile); waste – Mr. Oscar Paz (Bolivia). Mr. Riccardo de Lauretis and Mr. Aquiles Neuenschwander were the lead reviewers. In addition the expert review team (ERT) reviewed the national system, the national registry, and the calculations of the Party's assigned amount and commitment period reserve (CPR), and took note of the LULUCF parameters and the elected Article 3, paragraph 4 activities. The review was coordinated by Ms. Rocio Lichte (UNFCCC secretariat).

2. In accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the Government of Spain, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

1. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial report prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report was submitted on 19 December 2006, which is in compliance with decision 13/CMP.1. In its initial report Spain refers to its 2006 greenhouse gas (GHG) inventory submission of 12 April 2006. The Party submitted a revised initial report and officially resubmitted its GHG inventory for the entire 1990–2004 time series on 8 June 2007 in response to questions raised by the ERT during the course of the in-country visit. Spain also provided additional information in support of these revisions as requested by the ERT. This report is based on both the resubmitted revised initial report and the revised GHG inventory.

2. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report and reflects revised estimates provided by Spain resulting from the review process. These revised values are based on revisions of the emission estimates in the energy, agriculture and waste sectors, namely carbon dioxide (CO_2) from civil aviation (see para. 48), methane (CH_4) and nitrous oxide (N_2O) from field burning of agricultural residues and N_2O from direct emissions from soils – crop residues (see para. 76), and CO_2, CH_4 and N_2O from solid waste disposal and CH_4 and N_2O from waste incineration (see para. 102). These revisions resulted in revisions of the estimates of total national GHG emissions, and for the base year led to an increase in estimated emissions from 289,385,637 tonnes CO_2 equivalent as reported originally by the Party to 289,773,205 tonnes CO_2 equivalent – an increase of 387,568 tonnes CO_2 equivalent compared to the estimate reported originally by the Party (see para. 112).

5. The information in the initial report generally covers the information required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties serving as the Meeting of the Parties (CMP). However, in the initial report as originally submitted, the section on the agreement under Article 4 of the Kyoto Protocol has not been provided, nor has the justification for the choice of a forest definition that is different from the Food and Agriculture Organization of the United Nations (FAO) definition under the Kyoto Protocol. In addition, during the

review Spain presented revised information on the registry system, clarifications with regard to the organization of the national system and recalculations in the waste sector which change estimated base year emissions and, correspondingly, the assigned amount and the commitment period reserve. The ERT therefore requested Spain to provide a revised initial report that includes the new information and explanations provided to the ERT during the review and the information that was not provided in the initial report as originally submitted. The revised initial report and additional information were provided to the ERT by 8 June 2007 (see para. 3).

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

Item	Provided	Value/year/comment
Complete GHG inventory from the base year to the most recent year available (2004)	Yes	Base year: 1990
Base year for HFCs, PFCs and SF_6	Yes	1995
Agreement under Article 4	Yes	115%
LULUCF parameters	Yes	Minimum tree crown cover: 20% Minimum land area: 1 ha Minimum tree height: 3m
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	Spain elected forest management and cropland management under Article 3, paragraph 4, of the Kyoto Protocol. Spain has decided to account for each activity under Article 3, paragraph 3 and elected activities under Article 3, paragraph 4, at the end of the commitment period.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	1,663,967,412 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised estimate	Yes	1,666,195,929 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	1,497,570,670 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised estimate	Yes	1,499,576,336 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	A revised description was provided which is in accordance with the guidelines.
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	A revised description was provided which is in accordance with the guidelines.

3. Transparency

6. The initial report is generally transparent. During the review Spain provided more detailed information on the planned identification of land-use areas associated with activities under Article 3, paragraph 4, of the Kyoto Protocol, which further improved the transparency of the report. Upon the ERT's request, Spain included this information in its revised version of the initial report. An additional methodological document exists in Spanish, structured according to the air pollutants inventory (i.e. using the CORINAIR Selected Nomenclature for Air Pollution (SNAP) codes), which provides more detailed and disaggregated information on the emission estimation and the coverage of individual categories, which further increases transparency (this document is hereinafter referred to as the methodological background document).

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

7. In the base year (1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the most important GHG in Spain was CO_2, contributing 78.9 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by CH_4 (9.6 per cent) and N_2O (9.6 per cent) (see figure 1). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 1.9 per cent of the overall GHG emissions in the base year. The energy sector accounted for 73.4 per cent of total GHG emissions in the base year, followed by agriculture (13.9 per cent), industrial processes (9.6 per cent), waste (2.6 per cent) and solvent and other product use (0.5 per cent) (see figure 2). Total GHG emissions (excluding LULUCF) in the base year amounted to 289,773.21 Gg CO_2 equivalent and increased by 48.0 per cent between the base year and 2004.

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

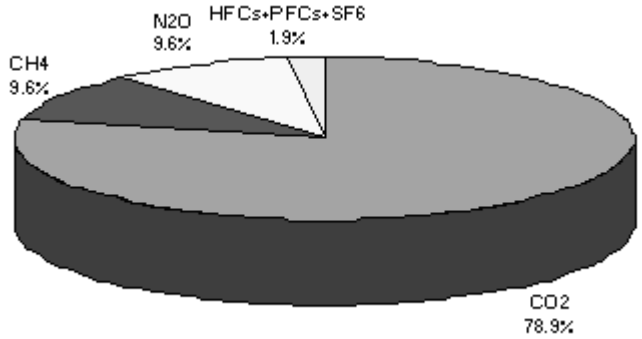
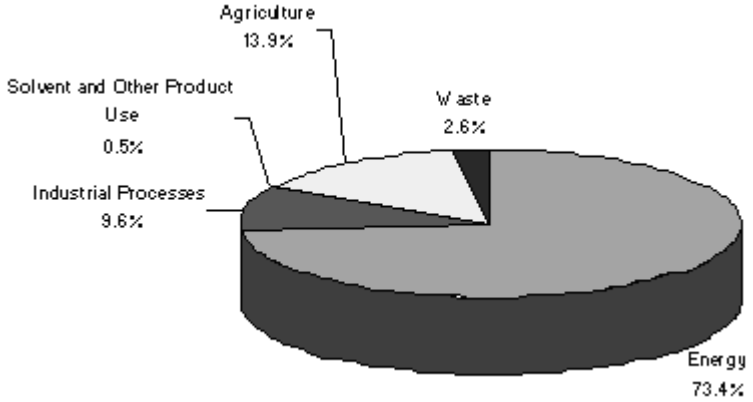


Figure 2. Shares of sectors in total GHG emissions, base year



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

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

Table 2. Greenhouse gas emissions by gas, 1990–2004[a]

GHG emissions (without LULUCF)	Gg CO_2 equivalent								Change BY–2004 (%)
	Base year	1990	1995	2000	2001	2002	2003	2004	
CO_2	228 511.44	228 511.44	255 696.67	307 648.62	311 526.18	330 525.53	333 860.52	354 516.65	55.1
CH_4	27 880.33	27 880.33	30 881.33	35 600.87	36 498.76	36 956.83	37 133.01	37 412.55	34.2
N_2O	27 795.15	27 795.15	26 546.02	33 080.86	31 848.46	31 115.58	32 835.36	31 655.99	13.9
HFCs	4 645.44	2 403.18	4 645.44	8 170.02	5 284.18	3 892.39	4 995.80	4 612.49	–0.7
PFCs	832.51	882.92	832.51	411.71	239.77	264.02	267.31	272.04	–67.3
SF_6	108.34	66.92	108.34	204.60	182.79	207.13	207.66	255.11	135.5

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

[a] Spain submitted revised estimates for the base year and all years of the 1990–2004 time series in the course of the initial review on 8 June 2007. These estimates differ from Spain's GHG inventory submitted in 2006.

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

Sectors	Gg CO_2 equivalent								Change BY–2004 (%)
	Base year	1990	1995	2000	2001	2002	2003	2004	
Energy	212 564.52	212 564.52	241 045.98	289 380.65	293 025.53	311 393.57	314 266.93	334 619.52	57.4
Industrial processes	27 879.06	25 645.79	27 441.51	34 509.98	31 540.04	30 924.33	32 514.66	32 706.94	17.3
Solvent and other product use	1 391.42	1 391.42	1 346.57	1 678.56	1 595.92	1 653.46	1 595.94	1 516.81	9.0
Agriculture	40 330.20	40 330.20	39 877.04	48 191.07	47 461.61	46 589.43	48 455.56	47 497.21	17.8
LULUCF	NA	– 23 027.25	– 24 747.36	– 30 219.86	– 31 760.12	–31 422.67	–30 234.23	–30 542.53	NA
Waste	7 608.01	7 608.01	8 999.20	11 356.41	11 957.05	12 400.71	12 466.57	12 384.34	62.8
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	264 512.68	293 962.94	354 896.82	353 820.03	371 538.81	379 065.42	398 182.29	NA
Total (without LULUCF)	289 773.21	287 539.94	318 710.30	385 116.68	385 580.15	402 961.48	409 299.65	428 724.82	48.0

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

[a] Spain submitted revised estimates for the base year and all years of the 1990–2004 time series in the course of the initial review on 8 June 2007. These estimates differ from Spain's GHG inventory submitted in 2006.

9. Spain's quantified emission reduction commitment is 92 per cent as included in Annex B to the Kyoto Protocol. As Spain is part of the European Community, whose member States will meet their reduction commitment jointly in accordance with Article 4 of the Kyoto Protocol, Spain's quantified emission limitation commitment is 115 per cent. Spain's assigned amount is calculated based on the Party's Article 4 commitment.

II. Technical assessment of the elements reviewed

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

10. Spain's national system is generally established in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). Spain has established legal, administrative and procedural arrangements to perform the general and specific functions as defined in decision 19/CMP.1 for the estimation of GHG emissions and removals.

11. Table 4 shows which of the specific functions of the national system have been implemented in Spain based on the information provided during the review and in the revised initial report.

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

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

* Mandatory elements of the national system.

1. Institutional, legal and procedural arrangements

12. During the in-country visit, Spain explained the institutional arrangements, as part of the national system, for preparation of the inventory. The Directorate-General for Quality and Environmental Evaluation (DGCEA) of the Ministry of Environment is the designated single national entity and has the general responsibility for inventory planning, preparation and management. This role was legally

approved by Order MAM/1444/2006 of 9 May 2006. Other organizations, institutes and departments of government ministries are also involved in the preparation of the inventory. The DGCEA has a contract, based on a public tendering procedure, with Análisis Estadistico de Datos, S.A (AED). AED supports the DGCEA, providing technical assistance for the data collection in all sectors, choosing the methods, activity data (AD) and emission factors (EFs), processing the data, maintaining the data in a database, performing quality control (QC) and quality assurance (QA) procedures, key category analysis, uncertainty estimation, recalculations and archiving the information. Thus, the consultant company plays a key role in supporting the DGCEA in the implementation of the functions of inventory preparation and management. The main collaborating ministries are the Ministry of Agriculture, Fisheries and Food (agriculture data), the Ministry of Economic Affairs (general national statistics), the Ministry of Interior Affairs (statistics on registered vehicles), the Ministry of Public Works (statistics on traffic data) and the Ministry of Industry, Tourism and Trade (energy and industry statistics). In addition, other departments of the Ministry of Environment also have a number of responsibilities in relation to the inventory and the Kyoto Protocol. These are the Directorate-General for Biodiversity (DGB) (for LULUCF), the Directorate-General of the Climate Change Office (OECC) (for registries and climate change policies), the DGCEA (for waste) and the Directorate-General for Water Quality (DGA) (for wastewater). In those collaborating ministries and directorates of the Ministry of Environment, focal points for communication with the DGCEA have been established. These focal points form formal working groups on specific topics related to the GHG inventory which are coordinated by the DGCEA. Three such working groups have been established for LULUCF, agriculture, and coordination with the autonomous regions (Comunidades Autónomas). Spain should report in its future national inventory reports (NIRs) on the progress achieved by the different working groups.

13. In addition to the order that established the DGCEA's role as the designated single national entity, other legislation has been put in place relating to the Spanish national system. The GHG inventory forms part of the national statistical plan, which is established by Royal Decree 1911/2004 for the period 2005–2008 and provides the legal basis and resources for data collection for the GHG inventory. A specific agreement with the Government's Delegated Commission for Economic Affairs (Comisión Delegada del Gobierno para Asuntos Económicos, CDGAE) outlines the data requirements from different ministries as well as the quality control requirements, establishes formal working groups which are coordinated by the DGCEA, and defines the timetable and responsibilities for the preparation and adoption of the annual GHG inventory.

14. In the energy sector, AED provides technical assistance to the data collection by means of questionnaires sent to about 150 institutions, including major point sources, industrial associations and other data-providing institutions such as ministries, and national statistics. The institutional relationships with the Ministry of Industry, Tourism and Trade and the Diversification and Energy Savings Institute (Instituto para la Diversificación y el Ahorro de la Energía, IDAE) have improved since the last in-country review and are planned to be further improved with the establishment of a formal working group. The data received by means of questionnaires are validated against the energy balances reported by the International Energy Agency (IEA) and the Statistical Office of the European Commission (Eurostat) (which are elaborated by the Ministry of Industry, Tourism and Trade), and against sectoral reports and other publications. For this purpose the DGCEA and AED have established a disaggregated energy balance which is not available from other sources in Spain. This balance compares the bottom-up and top-down estimates and identifies major discrepancies. The DGCEA and AED found considerable inconsistencies when comparing the top-down data with the bottom-up data on liquid fuel consumption for maritime, residential and agriculture sources, which it has so far not been possible to clarify with the Ministry of Industry, Tourism and Trade. The ERT urges Spain to increase the cooperation between the ministry and the inventory compilers in this area and to clarify the sources of the data used for reporting liquid fuel consumption for domestic and international navigation, fishing and other agricultural uses, and residential and non-energy fuel use to the IEA and Eurostat. Spain has not yet explored whether independent data sources exist in the energy sector for landfill gas and for gas from sewage sludge

treatment plants which have energy recovery. The ERT encourages Spain to further improve the institutional cooperation on the energy sector, and in particular between the national bodies dealing with renewable energies and liquid fuels, using the formal working groups of focal points already established.

15. Significant work remains to be done on the preparation of estimates of emissions and removals from LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in time for the inventory report for the first year of the commitment period. The work has been started with the establishment of a formal working group. The ERT recommends that clear responsibilities be assigned for the estimation of the data for the missing source and sink categories in the LULUCF sector and the estimation of emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The working group should also improve the land-use classification.

16. Spain has implemented significant improvements in key categories in the agriculture sector since the last in-country review and the Ministry of Agriculture, Fisheries and Food is providing good support of this work. These improvements, in particular related to research on country-specific EFs and parameters, are not yet fully completed and will lead to further recalculation in Spain's future inventories.

17. The waste sector is largely within the competence of the Ministry of Environment, and estimation methods have been improved in recent years, in particular regarding the estimation of CH_4 emissions from landfills. However, further work is needed on QA/QC procedures for the waste data and the estimation of uncertainties. There is no information in the NIR on the quality of some of the waste statistics used for the GHG inventory. The institutional relationships with data compilers for waste statistics, and with potential other data providers (e.g. for captured biogas), should be strengthened.

18. In Spain there is an established process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised by the inventory review. The responsible organization is the Government's Delegated Commission for Economic Affairs, which approves the draft inventory provided by the Ministry of Environment. The Commission is made up of delegates from all relevant ministries.

2. Quality assurance/quality control

19. Spain has elaborated and implemented a QA/QC plan in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). This includes general QC procedures (tier 1) as well as source/sink category-specific procedures (tier 2) for key categories and for those individual categories in which significant methodological and/or data revisions have occurred. Eleven distinct tier 1 QC checks are performed for all categories and registered in an electronic quality control register. A number of the questionnaires used for data collection include consistency checks, and automatic AD checks based on statistical methods are performed to detect outliers or inconsistent time series. The correct conversion of units is a feature that has been incorporated in the database system. Tier 2 QC activities are conducted for key categories, for categories that have been recalculated following methodological changes, and for categories for which higher-tier methods are used.

20. The Ministry of Industry, Tourism and Trade provided useful clarifications during the review on the QA/QC procedures implemented for key energy data. For the waste sector, the ERT noted a lack of QA/QC procedures (see also para. 103). No information was available on QC activities conducted for waste data collected in national statistics and on the quality of reporting from landfills. The ERT recommends Spain to complete the descriptions of QC activities run by outside data providers for all sectors and to include this information in the documentation of its QA/QC activities.

21. Specific QA procedures were implemented for the inventory of the agriculture sector, where experts from the University of Lérida and the Polytechnical University of Valencia reviewed the estimation methods and EFs used for GHG emissions related to livestock. The review activities resulted in major improvements and recalculations in the agriculture sector which are still ongoing. The DGCEA has established an agreement with the Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), an organization focused on research on energy, environment and technology, to conduct an independent review and a quality assurance exercise for the energy sector of the GHG inventory in 2007–2008. Under the European Community (EC) Directive on national emissions ceilings, the International Institute for Applied Systems Analysis (IIASA) in Austria reviewed the Spanish inventory of air pollutants, which is largely based on the same AD as the inventory of GHG emissions. A formal working group on inventories of air pollution has been established with the autonomous regions with the objective of harmonizing the regional and national inventories. This process may lead to the addition of further QA activities in the future.

22. Spain does not use the data collected from operators under the European Union (EU) emissions trading scheme (ETS) for purposes of quality assurance. As the EU ETS covers the same sectors as the plant-specific questionnaires used for the inventory, a comparison of the emission estimates, AD and EFs with the ETS data would offer a unique opportunity to cross-check the AD and EFs reported by plants and associations. The major barriers to using the EU ETS data are (a) the fact that these data are collected by the regional authorities in different formats, and (b) the confidentiality of the data reported. The ERT suggests that in the working group that has been set up with the regions, Spain address the use of the ETS data for QA of the GHG inventory and establish legal and procedural arrangements to enable a comparison of the AD and EFs reported under the EU ETS with the plant-specific data reported to the designated national entity.

3. Inventory management

23. Spain has a centralized archiving system located at the DGCEA, which includes the archiving of disaggregated EFs, AD, completed questionnaires, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. Most of the data are stored electronically, but some information for the early years of the time series is only stored in hard copy. Appropriate backup routines are in place. Spain has developed a separate electronic archiving system for the internal documentation on QA/QC procedures, external and internal reviews, documentation on annual key categories and key category identification, and planned inventory improvements. During the review, the ERT was provided with the archived information it requested and was given access to confidential information after the plants concerned had agreed to give it access.

24. Another key element of inventory management in Spain is the database system which stores the AD and EFs used, descriptions of these data (e.g. coverage) and the methodologies used, and performs the emission calculations. The relational database system is based on Oracle and is designed and maintained by AED. It includes GHG information as well as the data and calculations used for the inventories of acidifying agents, ozone precursors, heavy metals, particulates and persistent organic pollutants. The database includes data and information for emissions from energy, industrial processes, transport, agriculture and waste. It does not include the estimates for the LULUCF sector.

B. Greenhouse gas inventory

25. In conjunction with its initial report, Spain has submitted a complete set of common reporting format (CRF) tables for the years 1990–2004 and an NIR. The Party officially resubmitted its CRF tables for the years 1990–2004 on 8 June 2007 in response to questions raised by the ERT during the course of the in-country visit. Where needed the ERT also used Spain's 2007 submission, including the CRF tables for the years 1990–2005.

26. During the review Spain provided the ERT with additional information sources, inter alia the inventory submitted in 2007 and the underlying methodological background document. These documents are not part of the initial report submission. The full list of materials used during the review is provided in annex I to this report.

1. Key categories

27. Spain has reported a key category tier 1 analysis, both level and trend assessment, for all years of the time series and also applied a qualitative approach in determining its key categories as part of its initial report submission. Spain has not yet included the LULUCF sector in its key category analysis as the estimates in this sector are not yet complete. Spain is planning to implement a tier 2 analysis in 2008. The ERT encourages Spain to continue with these planned improvements. Spain should include the LULUCF sector in its key category assessment when the estimation of the category forest land is completed, and further subcategories should be added when the estimation of other LULUCF categories is finalized.

28. The key category analyses performed by the Party and the secretariat[2] produced somewhat different results due to different levels of disaggregation of categories in the key category assessment. Spain used a higher level of disaggregation for fuel combustion activities for certain plant types and fuel types in transport, which provides more useful results for the prioritization of resources and identification of improvements than the standardized procedure and is therefore in line with the IPCC good practice guidance. The key category analysis is used for the prioritization of resources, within the QA/QC plan and for the identification of improvements.

2. Cross-cutting topics

29. The inventory is generally in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). However, the estimation for the LULUCF sector is not yet complete. The only category estimated is forest land, and therefore only table 5.A of the CRF has been filled in for the LULUCF sector.

30. The inventory has been compiled in accordance with Article 7, paragraph 1, and decision 15/CMP.1 insofar as the initial report is concerned.

Completeness

31. The inventory is complete in terms of years and geographic coverage. Spain has provided inventory data for the years 1990–2004 covering all source and sink categories, except for the LULUCF categories other than forest land and non-CO_2 GHGs from LULUCF, and has included most of the required tables; however, tables 5.B–5.F and 5(I)–5(V) for LULUCF, table 7 (key categories), table 8(a) (recalculations) and table 8(b) (explanations for recalculations) have not been provided. The notation keys are used throughout the tables. CRF table 9 (completeness) has mostly not been filled in. Explanations for key categories and recalculations are provided in the NIR. Spain should complete the reporting of the CRF tables, in particular tables 9 (completeness) and 8(a) (recalculations), in its next inventory submission.

[2] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year or base year period as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

Transparency

32. The transparency of the NIR has improved considerably in recent years and Spain has implemented many of the suggestions provided in previous reviews. However, for most sectors the sources of information are not clearly referenced in the NIR and there is no list of references. The exact references were provided to the ERT as part of the underlying methodological background document. Spain should add the references of the sources of AD, EFs and other parameters, and provide a list of references in the NIR (either in each sector or at the end of the document). The transparency of its reporting could be improved if the NIR included a more detailed explanation of the main forces driving the emission trends, in particular when there are large inter-annual differences (e.g. in industrial processes).

Consistency

33. In general, Spain has provided consistent time series in accordance with the IPCC good practice guidance, and methodological improvements have been applied across the entire time series. A number of strong time-series fluctuations, in particular related to base year emissions, which are high, were investigated in detail by the Party in the course of the review and could be explained as being due to data from individual plants and specific circumstances for these years (e.g. for flaring of gases in the iron and steel industry).

Comparability

34. Spain generally follows the allocation of emissions according to the CRF and as recommended by the IPCC good practice guidance. Spain allocates emissions from flaring of gases (coke oven gas and blast furnace gas) under waste incineration – flaring in ferrous metallurgy. These CO_2 emissions occasionally occur in single years when some iron and steel plants are not able to sell the blast furnace gas produced. (Blast furnace gas is produced when carbon in coke is oxidized in the blast furnace and the carbon is used as a reducing agent to produce crude or pig iron.) The ERT believes that this allocation is not appropriate as the IPCC good practice guidance for the waste sector refers to the incineration of municipal solid waste, hazardous waste, clinical waste or sewage sludge in specific waste incineration plants, which does not include flaring of gases. The ERT therefore recommends Spain to report and specify CO_2 emissions from the flaring of blast furnace gas in the category iron and steel production (CRF table 2(I).A-G) under the subcategory other (2.C.1.5). The IPCC good practice guidance recommends reporting CO_2 emissions from blast furnace gas in the industrial processes sector. Spain currently does not report any other emissions in the proposed subcategory, so that the proposed allocation will allow a transparent presentation of this specific source of emissions which only occurs in some years.

Accuracy

35. Spain is generally using estimation methodologies which are in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance, and has provided a detailed tier 1 uncertainty estimation covering all sectors except LULUCF. In some instances the ERT found that Spain has used a rather conservative approach for the estimation of emissions in the base year, for example, related to the assumptions used in the estimation of emissions from landfills. As this review was focusing on the accuracy of the base year estimates (including potential overestimation of emissions), the ERT did not request full correction of these issues as part of this review. However, future reviews may highlight them as potential problems. There is considerable uncertainty related to the calculation of non-energy fuel use in the energy sector, as no reliable country-specific information is available on the feedstocks.

Recalculations

36. The national system can ensure that recalculations of previously submitted estimates of GHG emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance. The planned improvements are documented in the NIR and a new documentation system for recalculations is planned to be installed, but was not yet available during the review. Spain is encouraged to continue with the planned activities related to the documentation of planned improvements. Improvements plans for each sector should be compiled outlining the planned short-term and long-term improvements for each.

37. Spain provided recalculated estimates (tables 8(a)) for the years 1990–2003. The effect of the recalculations for the base year (as reported in the CRF tables) was an increase by 1.27 per cent in CO_2 equivalent emissions in 1990 (excluding LULUCF). Although table 8(b) lists the categories in which changes have occurred, it does not indicate the reasons for the recalculations. The reasons for the recalculations are explained in the sectoral chapters and in chapter 10.4 of the NIR. The major changes include:

(a) The improvement of CO_2 EFs for solid fuels in the energy sector, as recommended in previous reviews;

(b) The use of higher-tier methods for the main livestock categories within enteric fermentation in order to comply with the IPCC good practice guidance.

Uncertainties

38. Spain has provided a tier 1 uncertainty analysis for each category and for the inventory in total, following the IPCC good practice guidance. The LULUCF sector is not included in the uncertainty analysis.

39. The information sources for the uncertainty estimates were the IPCC good practice guidance, analysis and data comparisons of the inventory compilers, and expert judgements collected from data providers. A standardized questionnaire is used to collect and document the information collected on uncertainties from data providers. The total uncertainty of the GHG inventory is estimated at 3–3.5 per cent for the trend and 6–7 per cent for the level of GHG emissions. Further work on a tier 2 uncertainty assessment is planned for the future and the ERT encourages these plans. The ERT also recommends Spain to include the LULUCF sector in its future uncertainty analysis.

3. Areas for further improvement identified by the Party

40. In its response to the issues raised during the review, Spain indicated that it is working to improve its national system and cross-cutting areas related to the following aspects. It intends to:

(a) Implement a tier 2 key category and uncertainty analysis in 2008;

(b) Start a more intensive cooperation process with the formal working groups composed of ministerial focal points and the DGCEA;

(c) Complete its estimation in the LULUCF sector;

(d) Conduct QA procedures for the energy sector and for quality control procedures;

(e) Fully implement the documentation system for QC checks and planned improvements.

4. Areas for further improvement identified by the ERT

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

(a) Improve the institutional cooperation and administrative arrangements in relation to the reporting of consumption of liquid fuels in different sectors, and resolve and explain the time-series inconsistencies in the data for some major liquid fuels;

(b) Improve the institutional cooperation between the inventory compilers and other ministries/departments in the agriculture and LULUCF sectors in the working group on LULUCF and agriculture. Clear responsibilities for the estimation of the missing categories and for the corresponding CRF tables in the LULUCF sector should be assigned. The working group should also improve Spain's land-use classification as well as its data for the estimation of emissions and removals from agricultural land uses;

(c) Encourage participation of the autonomous regions in the formal working groups, and develop legal arrangements to enable a comparison of installation-specific AD and EFs reported under the EU ETS with the plant-specific data reported to the inventory agency;

(d) Provide references and a list of references in the NIR.

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

5. Energy

Sector overview

43. In the base year, the energy sector accounted for 73.4 per cent of total national GHG emissions. The most important energy categories were energy industries, with 26.8 per cent of total national emissions, transport, with 19.9 per cent, and manufacturing industries and construction, with 16.1 per cent.

44. The NIR is very transparent for the energy sector. It includes sections discussing the AD, EFs, estimation algorithms, completeness, transparency, the consistency of the time series, methodologies, uncertainties, QA/QC, recalculations and planned improvements for each category analysed.

45. Spain's key category analysis for the energy sector is more disaggregated than the one performed by the secretariat and identified 13 key categories on the level assessment, accounting for 72 per cent of total national GHG emissions in 1990.

46. The NIR explains the emission trends at a rather aggregated level that is in line with the disaggregation used for the key category assessment for manufacturing industries and construction and other sectors. However, the explanations at this aggregate level do not provide a sufficient explanation of each of these categories. The ERT encourages Spain to provide a more detailed explanation of the emission trends for the subcategories under manufacturing industries and construction and other sectors, for example, explaining the emission trend for the residential sector separately from the trend for commercial/institutional fuel combustion.

47. QA/QC activities are implemented in the energy sector for data processing and for the data collected by means of questionnaires. Many different ways of cross-checking data with other data sources, for example, plant-specific AD with aggregated data taken from the industrial associations or national statistics, are used to check the reliability of the data provided by plants and associations.

48. For civil aviation, the ERT noted that jet kerosene consumption reported to the IEA for the year 1990 is 19.4 per cent lower than the figure reported in the CRF, which could be due to an error in the estimation algorithm, as explained by Spain during the review. The ERT recommended Spain to further investigate the reason for this discrepancy and correct the CO_2 emission estimate for civil aviation accordingly, if necessary. During the review Spain was able to explain the discrepancy in the fuel

consumption data (see para. 61). However, Spain found an error for the CO_2 EF used in the module of calculation of landing and take-off emissions at airports and corrected this EF accordingly. The corrected EF for CO_2 (72.65 kg CO_2/GJ) is slightly lower than the one originally used (72.75 kg CO_2/GJ). As recommended by the ERT, Spain provided revised estimates to correct for the error identified. This revision reduced the estimate of CO_2 emissions from civil aviation for 1990 from 4,135.39 Gg CO_2 as originally reported to 4,129.65 Gg CO_2, and hence the CO_2 emission estimate from the energy sector as a whole, by 5.7 Gg CO_2 compared to the estimate originally provided.

49. Considerable inconsistencies were found in the data on liquid fuel consumption for maritime, residential and agriculture sources when comparing the IEA and Eurostat energy balances data with bottom-up data balance compiled for the inventory, and could not at this stage be clarified with the Ministry of Industry, Tourism and Trade, taking into account that the information this ministry uses to compile the energy balance is mainly based on information from the supply side. The ERT urges Spain to increase the cooperation between the ministry and the inventory compilers in this area and to clarify the sources of the data used for the reporting of liquid fuel consumption for domestic and international navigation, fishing and agricultural uses, and residential as well as non-energy fuel use, to the IEA and Eurostat, and to report on progress in its future inventory submissions.

Reference and sectoral approaches

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

50. CO_2 emissions from fuel combustion have been calculated using both the reference approach and the sectoral approach. For the year 1990 there is a difference of 1.05 per cent in the CO_2 emission estimates between the two approaches. The NIR explains the reasons for differences between the two approaches.

International bunker fuels

51. For international bunker fuels consumption Spain uses the information from the IEA, which is provided to the IEA by the Ministry of Industry, Tourism and Trade. For marine bunkers, as far as national ships are concerned, that information was checked against the corresponding information given by other information providers (mainly Puertos del Estado, the national ports authority, and the Asociación de Navieros Españoles (ANAVE), the national merchant marine association). These two institutions, in cooperation, provided data for the years 1992–2002 (which were later extrapolated to the remaining years of the inventory period) on fuel consumption for each nationally-registered vessel, and ANAVE established the split of maritime fuel consumption into national and international fuel consumption. Comparison of the two data sources (IEA and ANAVE) shows small discrepancies for the base year, but rather large discrepancies for more recent years. The ERT encourages Spain to carry out additional studies to clarify these inconsistencies in the data for liquid fuel consumption, in cooperation with the Ministry of Industry, Tourism and Trade, and to use other information for international transportation to reduce the uncertainty in the AD for international bunkers, in particular marine bunkers.

52. For maritime fuel consumption there are also uncertainties relating to the allocation of gas oil and fuel oil consumption to the different sectors, that is, to the maritime and other sectors (such as the agriculture sector), which could affect the split between national and international fuel consumption and hence the estimate of total national GHG emissions (see also para. 62).

Feedstocks and non-energy use of fuels

53. Spain was not able to explain to the ERT in a transparent way how the fuel quantities reported under non-energy fuel use in the national energy balance are compiled and which exact data sources were used. The ERT was therefore not able to assess the estimation of non-energy fuel use and related potential double counting of emissions. The ERT recommends Spain to improve the information on

non-energy fuel use by undertaking a study on this issue with relevant industries and with the Ministry of Industry, Tourism and Trade, and to report on progress in its future annual inventory submissions. Such an investigation may also resolve some of the discrepancies that were detected relating to liquid fuel consumption.

54. Specifically with regard to carbon stored in petroleum coke, the ERT noted that there appears to be an error in the value reported in the reference approach (CRF table 1.A(b)). The value reported corresponds to non-emitted Gg of CO_2 from petroleum coke rather than to carbon stored in the unit of Gg C (see also the data reported for coke under "other" in table 1.A(d) on feedstocks and non-energy use of fuels). As a result of this error, total emissions from the reference approach in the year 1990 appear to be underestimated by 1,468 tonnes CO_2. This does not, however, affect total emissions from the energy sector.

55. Spain reports that it uses default carbon (C) storage ratios. The quantities of feedstock fuels reported are large, and the total quantity of CO_2 not emitted has a high level of uncertainty. The use of plant-specific data on C stored would improve the estimates significantly. Spain should develop country-specific storage ratios.

Key categories

Energy industries – public electricity and heat production: liquid/solid/gaseous and other fuels – CO_2, CH_4, N_2O

56. Information about fuel consumption for this source (which in the base year accounted for 22.3 per cent of total national GHG emissions) for the years 1990–1993 was obtained from OFICO (an official institution which, at that time, was the authoritative body for this information), and for 1994 onwards data was obtained directly from the thermal plants by means of individualized questionnaires. Estimates of emissions data for the years 1990–1993 were also provided by OFICO. The emission calculations are in line with the IPCC good practice guidance. For the year 1990 the estimates have remained unchanged since the 2005 submission, that is, no recalculations have been undertaken.

Road transportation: gasoline, diesel oil, LPG – CO_2, CH_4, N_2O

57. Activity data are obtained from national statistics and emissions calculated using the COPERT III model. For the year 1990, the CO_2 estimates have remained unchanged since the 2005 submission, that is, no recalculations have been undertaken.

Manufacturing industries and construction: liquid/solid/gaseous fuels, biomass – CO_2, CH_4, N_2O

58. Information on AD is provided by sectoral associations and by means of plant-specific questionnaires which cover the major installations. The emission calculations are in line with the IPCC good practice guidance. The NIR is very clear and detailed for this category, including EFs for different technologies, fuel consumption per fuel category, uncertainty analysis and QA/QC.

Other sectors: liquid/solid/gaseous fuels, biomass – CO_2, CH_4, N_2O

59. In the NIR the category other sectors (which in the base year accounted for 9.1 per cent of total national GHG emissions) is presented within the same paragraph (3.5) as manufacturing industries and construction; nevertheless the analysis for the category other sectors is clearly differentiated as regards fuel consumption (broken down by fuel type) and emission factors (broken down by fuel type for each installation class and source category (industrial or other sectors)). The other sectors include important subsectors: the residential sector (4.8 per cent of total national emissions); agriculture/forestry/fisheries (3.0 per cent); and commercial/institutional (1.3 per cent). These sectors make important individual contributions and have different characteristics and specificities. The ERT recommends Spain to expand

the description of the individual contributing sources for this category in the NIR, drawing on the more detailed methodological background document.

Energy industries – petroleum refining: liquid/gaseous fuels – CO_2, CH_4, N_2O

60. Emissions from this category accounted for 3.8 per cent of total national GHG emissions in the base year. Information about fuel consumption and its technical specifications are obtained directly from the 10 refineries in the country. The emission calculations are in line with the IPCC good practice guidance. The NIR is very clear and detailed for this category, including regarding methodology, uncertainty analysis, time-series consistency and QA/QC.

Civil aviation: jet kerosene – CO_2

61. The amount of jet kerosene consumption reported to the IEA for the year 1990 is 19.4 per cent lower than the figure reported in the CRF according to the 2006 synthesis and assessment report. The ERT noted that this may indicate a possible overestimation of national aviation emissions in the base year. In response to questions raised during the review, Spain clarified that the IEA energy statistics report three fuel types used for domestic aviation in the base year, which are aviation gasoline, gasoline-type jet fuel and kerosene-type jet fuel. The consumption of gasoline-type jet fuel was not taken into account in the comparison of the synthesis and assessment report. When this additional consumption is included in the comparison, the discrepancies between the IEA data and the national inventory data for aggregated fuel consumption in domestic air travel are negligible in terms of mass (the original measurement unit in the IEA and the inventory balances). Nevertheless, when the IEA data and the national inventory data for this fuel consumption are compared in terms of energy, instead of mass, some minor discrepancies arise due to differences between the net calorific values used by the IEA and those used in the emissions inventory. In consequence, there is no longer an indication that emissions from civil aviation may be overestimated in the base year. Instead, the explanations provided by Spain demonstrated that the comparison made in the course of the review was incomplete for the IEA data. However, during the review Spain informed the ERT that the 2006 inventory contained an error in the estimation algorithm for the CO_2 EF. This error was corrected during the review – from 72.75 kg CO_2/GJ to 72.65 kg CO_2/GJ – and a revised estimate for CO_2 emissions from civil aviation was provided, resulting in a slightly lower estimate of CO_2 emissions for the entire time series (see also para. 48).

Navigation: liquid fuels – CO_2, CH_4, N_2O

62. Data for fuel consumption from this source (which accounted for 0.5 per cent of total national GHG emissions in the base year) come from the IEA, Puertos del Estado and ANAVE. The split of maritime fuel consumption into national and international fuel consumption was established by experts from ANAVE. There are also uncertainties relating to the allocation of gas oil and fuel oil consumption to the different sectors, that is, to the maritime and other sectors (such as the agriculture sector), which could affect the split between national and international fuel consumption and hence the estimate of total national GHG emissions (see also para. 52).

6. Industrial processes and solvent and other product use

Sector overview

63. In the base year, the industrial processes sector accounted for 9.6 per cent of total national GHG emissions. The CRF includes estimates of all gases and sources in the industrial processes sector, as recommended by the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The emission estimates are consistent across the time series, and EFs are used in a consistent way and are comparable with those reported by other Parties. The methodologies used are reported in detail, as well as AD and EFs. Basic data for the sector are available at a highly disaggregated level and in most cases are collected on a plant-by-plant basis. A few members of the ERT were given access to confidential

information for production of soda ash and of halocarbons and SF_6, after the plants concerned had agreed to give access to it, which facilitated the review of these estimates and hence contributed to their transparency. Transparency could, however, be improved by including in the NIR a more detailed explanation of the main forces driving the emission trends, particularly when there are large inter-annual fluctuations. In some cases the notation keys have not been used in the appropriate way. For HFCs, PFCs and SF_6, Spain has reported actual emissions. Estimates for potential emissions of these gases are not provided, mainly because of the current lack of information on imports and exports per gas. Spain is encouraged to continue its efforts to collect reliable data to help in the estimation of potential emissions of fluorinated gases (F-gases) and to improve the use of the notation keys in line with the definition in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

64. The general QA/QC procedures that are used for the inventory as a whole are applied in this sector. QA/QC should be improved in this sector by systematically comparing the basic information collected for the inventory with that collected and reported within the framework of the EC directives on the EU ETS, the European Pollutant Emission Register (EPER) registry, the limitation of emissions of certain pollutants into the air from large combustion plants (LCP) directive, or statistical production data (PRODCOM).

Key categories

Cement production – CO_2

65. Cement production is a key category on both level and trend assessment, accounting for 4.3 per cent of total national base year emissions. Activity data and the main information on EFs are collected directly by the industrial association (OFICEMEN). The methodology is well explained in the NIR. In response to the recommendations of the 2005 review report, Spain has verified the average EF supplied by the industrial association by collecting basic data from some plants for different years and has recalculated the average EF on the basis of these data. The ERT acknowledges the efforts made by Spain to review and improve the information used to estimate emissions. The QA/QC activities developed in the sector were explained during the review but they are not reported in the NIR. To improve transparency, the ERT suggests that Spain report in the NIR the QA/QC activities developed for the sector, such as the comparison with other databases and the ratio between clinker and cement production data. The ERT also suggests that Spain provide in the NIR a more detailed explanation of the emission trends, comparing production and emissions data with energy and economic data for the sector. The ETS data also could improve both the emission estimates and the uncertainty analysis for the most recent and future years. The ERT noted that it would be useful for Spain to use the ETS data in a systematic way to improve its emission estimates.

Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6

66. In the base year (1995 for this source), CO_2 equivalent emissions amounted to 116.24 Gg, while in 2004 they amounted to 4,170.26 Gg, or less than 1 per cent of total national emissions. This is a key category on both level and trend assessment. The NIR provides a methodology for each activity that involves consumption of these gases. Information on the consumption of halocarbons and SF_6 in semiconductor manufacturing is currently lacking. According to the main company which distributes F-gases in Spain, such consumption does not occur. Spain is encouraged to continue with the improvements it plans, looking for other sources of information for emissions from semiconductor manufacturing involving the other ministries and industry contacts.

Iron and steel production – CO_2

67. Emissions from the combustion of fossil fuels in external units, such as blast furnaces cowpers and sinter furnaces burners, are reported under the energy sector, while the emissions originating from

the internal processes where carbon can act as a fuel and a reduction agent are allocated under the industrial processes sector, having been estimated as the net difference between flows of inputs and outputs in such processes. Incineration of waste gases from iron and steel industry should also be reported under this sector, as explained in detail in subsection II.B.9 below (see also para. 34). The Party is encouraged to report clearly in the NIR on this allocation in order to give assurance that there is no omission or double counting between the industrial processes, energy and waste sectors.

Limestone and dolomite use – CO_2

68. Spain reports in the NIR that CO_2 emissions from limestone and dolomite consumption come from the manufacturing frits of glass, brick and tiles, magnesium production, and the use of limestone for environmental pollution control purposes in energy production plants. The NIR reports in detail the methodology, AD and EFs used to estimate emissions.

Nitric acid production – N_2O

69. In the previous review, the ERT recommended that Spain establish direct contact with the production plants in order to verify the country-specific average EF of 7 kg per tonne of production, which is supplied by the Chemical Industry Association; Spain reports in the NIR that it plans to make this improvement. Spain is encouraged to collect information from the plants to verify the average EF for this key category.

Production of halocarbons and SF_6 – HFC-23

70. In response to the comments of the previous (2005) review, Spain reports in the NIR detailed information regarding the methodology used and the emission trend in this key category.

7. Agriculture

Sector overview

71. In the base year, the agriculture sector accounted for 13.9 per cent of total national GHG emissions. Emission estimates have been reported for all categories of the sector and all the CRF tables have been filled in. The ERT concluded that the time series is consistent.

72. Spain is undertaking improvements in the estimation methods used in the agriculture sector. A number of improvements have already been implemented, including improvements to the institutional arrangements, and obtaining new AD for animals and crops and national EFs based on national studies and reviews of relevant literature, but these improvements were not yet fully implemented at the time of the review. Spain is planning additional national studies to obtain specific national information, such as studies on different breeds of cattle and the percentage shares of the different animal waste management systems (AWMS) used. These future changes in the methodology which the inventory agency plans may change the emission estimates for all years of the time series. The improvements implemented so far have resulted in an increase in the estimates of emissions for all years.

73. Spain identified six key categories in the agriculture sector for 1990, that is, one more compared to 2004. CH_4 emissions from enteric fermentation, direct and indirect N_2O emissions from agricultural soils, and CH_4 and N_2O emissions from manure management are key categories in all years of the period 1990–2004. (N_2O emissions from animal production (agricultural soils) was a key category in 1990–1992, 1995–1999 and 2003.) Spain has used tier 2 methods for the main emission sources within the category (see paras. 78 and 81) and tier 1 for the remainder.

74. As regards recalculations in the agriculture sector, only the quantitative results have been provided, but no explanations are given for emission trends where these are affected by changes of methodology or recalculations. The recalculations undertaken for the 2006 submission increased the

estimate of emissions from the sector in the base year by 7.9 per cent compared with the 2005 submission (for the 1990 inventory originally submitted as part of the 2006 submission, this difference was 7.1 per cent). The main categories responsible for this change were manure management and agricultural soils. The ERT recommends Spain to improve its reporting of major recalculations by explaining how methodological changes impact on the trend in emissions.

75. The new methods used by Spain to obtain AD have resulted in more reliable estimates for the agriculture sector. Spain has implemented a new QA/QC procedure to analyse and verify what national information can be used for estimating emissions and what information is to be discarded; this procedure has enabled it to identify and prioritize new studies for the future. This QA/QC procedure also permitted verification of overlaps with other sectors, such as LULUCF and waste.

76. The ERT noted that the coverage of crops in the estimates of emissions for crop residues of agricultural soils and field burning of agricultural residues was not fully complete, although it recognizes that Spain has applied the estimating procedure to a very extensive list of crops (in fact a much more extensive list than the one provided in table 4.16 of the IPCC good practice guidance). During the review Spain provided additional information, including tables, in particular on crops (including on the cultivation of grapes and olives), which is not included in the NIR and which helped to clarify the estimates of emissions from crop residues of agricultural soils and field burning of agricultural residues. In addition, Spain used this information to revise its estimates of N_2O emissions from agricultural soils and N_2O and CH_4 from field burning of agricultural residues, and included these estimates in the revised inventory that it resubmitted after the in-country visit. These revisions changed the estimates of total GHG emissions from the agriculture sector in the base year from 39,996.03 Gg CO_2 equivalent as initially reported to 40,330.20 Gg CO_2 equivalent (see paras. 90–91). The ERT encourages Spain to include this new information, including references to the sources of such data and information, in its next submission in order to enhance the transparency of the NIR.

77. The ERT recommends Spain to continue to implement the improvements suggested in the NIR for the entire time series.

Key categories

Enteric fermentation – CH_4

78. Enteric fermentation is the main source of CH_4 emissions (contributing 42.2 per cent to total national CH_4 emissions in 1990). The main subcategories are sheep, with 36 per cent of the emissions from enteric fermentation in 1990, followed by non-dairy cattle with 34 per cent. A tier 2 methodology has been used for the main livestock categories (cattle and sheep), and for the other animal types tier 1 (including default EFs) has been used in line with the IPCC good practice guidance.

79. The AD used come from the official *Anuario de Estadística Agroalimentaria* and *Boletines Mensuales de Estadística Agraria* which are available on the website of the Ministry of Agriculture, Fisheries and Food.

80. This is the only category for which recalculations resulted in a decrease of estimated emissions (by 6.9 per cent for the base year). The ERT recommends Spain to continue the studies to obtain national information about enteric fermentation in the different types of animal.

Manure management – CH_4

81. Emissions from this source increased by 42.8 per cent between 1990 and 2004, mainly due to an increase in nitrogen (N) excretion per AWMS for non-dairy cattle and swine. A tier 2 methodology has been used for the main sources (swine and cattle), while for the other animal types tier 1 has been used in line with the IPCC good practice guidance.

82. Spain has used the default IPCC parameters for maximum methane producing capacity (Bo) and equation 4.16 of the IPCC good practice guidance for volatile solids excretion (VS) for cattle. It has used a linear function to calculate VS from swine, based on the IPCC default data according to animal weight. The original IPCC methane conversion factor (MCF) stepped function, based on temperature ranges given by the IPCC good practice guidance, has been smoothed out based on continuous temperature variation. The ERT considers this as an appropriate method given the national circumstances of Spain. For the remaining animal types Spain has used basically tier 1 methods, but with the EF functions smoothed out in the same way as the temperature ranges.

83. The ERT recommends Spain to continue the studies to obtain national information about the allocation of animal manure to different AWMS.

Manure management – N_2O

84. Spain has used equation 4.18 of the IPCC good practice guidance with national parameters, developed by national studies of manure management systems, and the same national classification system as was used for CH_4 from manure management.

85. This category showed the highest increase resulting from recalculations (51 per cent in the base year).

Agricultural soils – N_2O

86. The main sources of emissions from this category in 1990 were indirect emissions due to nitrogen leaching and run-off, followed by direct soil emissions resulting from the use of synthetic fertilizers.

87. Spain has used the default EFs of the IPCC good practice guidance for each subcategory.

88. Spain reports emissions under the category "other", which include emissions generated by domestic wastewater sludge and municipal solid waste compost applied to soil.

89. The emission estimates for this category currently do not include all crops. This will lead to future recalculations, which could increase the estimates of emissions for all years of the time series. The same AD as are used for estimating this category are also used to estimate emissions from field burning of agricultural residues (see para, 91). Spain is encouraged to include all relevant crops in its estimates for N_2O emissions from soils.

90. During and after the review, Spain provided new national information and data on the cultivation, including cultivated areas, of grapes and olives, which represent a significant portion of the total cultivated lands in Spain. The inclusion of data on these crops in the category direct emissions from soils – crop residues led to an increase in the estimate for N_2O emissions from this category in the base year from 32.52 Gg N_2O as originally reported to 32.60 Gg N_2O as reported in Spain's revised resubmitted GHG inventory (corresponding to an increase of 25.67 Gg CO_2 equivalent in the base year compared to the estimate originally reported by Spain).

Non-key categories

Field burning of agricultural residues – CH_4, N_2O

91. Spain has compiled and reviewed information from existing studies to obtain national information required to estimate emissions from field burning of agricultural residues. This national information was used to recalculate the entire time series, and the emission estimates for this category are now considered to be almost complete. During the review Spain provided new data on the cultivation of grapes and olives (see also para. 90 above), which it used to revise its estimates from this category after the review. The consideration of these data for estimating CH_4 and N_2O emissions from burning of

residues in vineyards and olive groves increased the estimates of CH_4 and N_2O emissions from field burning of agricultural residues by 308.50 CO_2 equivalent compared to the estimate initially reported for the base year (i.e. from 229.53 Gg CO_2 equivalent to 538.03 Gg CO_2 equivalent in the revised resubmission). In the 2005 submission the N_2O emissions were estimated using a national methodology to calculate the N contained in the burnt residues. In the 2006 submission the IPCC good practice guidance approach has been followed to calculate the N present in the burnt residues.

92. In order to increase transparency and to avoid possible future overlaps between the agriculture and LULUCF sectors, the ERT recommends Spain to continue the improvements to its institutional arrangements that are already under way for establishing a national land-use classification in such a way as to contribute to the transparency of its GHG inventory where agricultural soils are concerned.

8. Land use, land-use change and forestry

Sector overview

93. In 1990, the LULUCF sector in Spain constituted a net sink of 23,027.25 Gg CO_2 equivalent. In 2004, this net sink amounted to 30,542.53 Gg CO_2 equivalent, which represents an increase of 32.6 per cent over the period. The area of forest land remaining forest land increased by 14.6 per cent over the period 1990–2004 due to afforestation and reforestation activities and natural regeneration occurring in croplands and grasslands. All removals were due to biomass growth in forest land, while emissions arose from wood harvest and fuelwood collection.

94. In the 2006 submission, CO_2 emissions and removals estimates are provided only for the category forest land. No information or data are provided on sources and sinks in any of the other land-use categories, or for non-CO_2 emissions. Spain informed the ERT that emissions and removals from the land-use categories cropland, grassland, wetlands, settlements and other land are not reported because the data requested in the IPCC good practice guidance for LULUCF for calculations by the tier 1 method were not available. The ERT recommends that Spain provide estimates for all relevant categories of the LULUCF sector and complete all the CRF tables for all other land-use categories in its future submissions for the sake of completeness and consistency.

95. The ERT noted that the official data on the areas of land use and land-use change for the forest land category presented inconsistencies which are due to the use of different sources of activity data. The sources are mainly the second and third National Forest Inventory (NFI2 and NFI3) – covering the years 1986–1995 and 1997–2006, respectively – and data and maps from the Ministry of Agriculture, Fisheries and Food. The ERT recommends Spain to strengthen its institutional arrangements in order to standardize the definitions and official data on the areas of land use and land-use change, and to develop a matrix of land-use change among the different land-use categories, including for agriculture, in order to be able to report GHG inventories under the Convention and under the Kyoto Protocol. Spain informed the ERT that it is developing a National Geographical System to account for LULUCF activities under the Kyoto Protocol, and that it is expected to be operational in 2009. The ERT recommends that this system be incorporated in the national inventory system, along with the NFI and related data.

96. In its initial report, Spain has reported that its definition of forest adopted for Article 3, paragraphs 3 and 4, activities under the Kyoto Protocol consists of a minimum tree crown cover of 20 per cent, a minimum land area of 1 ha and a minimum tree height of 3 metres. Where tree crown cover is concerned, the definition of 20 per cent differs from that which Spain uses for reporting under the Convention and to the FAO, which is 10 per cent. During the review and in its revised initial report Spain explained that the forest definition adopted for Article 3, paragraphs 3 and 4, activities under the Kyoto Protocol is compatible with the data submitted to the FAO. The definition of 20 per cent for tree crown cover has been chosen to exclude land areas of open type forests that have a tree crown cover of over 10 per cent, but have mainly agricultural purposes; hence, it is considered to be conservative. The ERT noted that the fact that a different definition has been adopted for reporting under the Kyoto

Protocol means that carbon stocks and carbon stock changes to be reported under the Kyoto Protocol will be different from those reported under the Convention in the base year and all years of the time series. Spain informed the ERT that the NFI includes tree crown cover thresholds of 10 per cent and 20 per cent, and that separate calculations are to be made. The ERT recommends that Spain consider recalculating carbon stock change according to the Kyoto Protocol definition of forest.

97. Neither QA/QC procedures for the LULUCF sector nor estimates of uncertainty are reported in the 2006 NIR, nor is a LULUCF key category analysis. Spain informed the ERT that QA/QC procedures, uncertainty assessment and a key category analysis will be considered for the LULUCF sector in its future submissions.

Key categories

Forest land – CO_2

98. The 2006 NIR (page 7.9) reports that most of the biomass expansion factors (BEFs) for commercial volume (mainly from native species) are country-specific (table 7.2.11) and that default values from the IPCC good practice guidance for LULUCF were applied for those species for which a country-specific value is not available. The same applies to wood density (D). Spain has used a country-specific BEF multiplied by D, which is named BEFD, developed by the Centro de Investigación Ecologica y Aplicaciones Forestales. The root to shoot ratio (R) used is a default value for coniferous and broadleaf species.

99. For estimating carbon stock changes, all forest land is assumed to be managed. Only emissions and removals from living above- and below-ground biomass are estimated according to the tier 1 method of the IPCC good practice guidance for LULUCF. Spain informed the ERT that soil organic carbon is being investigated and will be reported in its future submissions, while dead organic matter is considered constant under the tier 1 method. The ERT recommends that, according to decision 16/CMP.1, carbon stock changes in all forest carbon pools should be estimated unless the Party can demonstrate that a pool is not a source. If the tier 1 method is used, improved justification should be provided as to why the dead organic matter pool is considered not to be a source.

100. In the 2006 NIR, carbon loss from fuelwood collection is reported and a methodology is provided. However, in the current carbon estimation, only D and wood carbon content (CF) are applied in calculating dry matter volume, and no BEF is applied. The ERT recommends Spain to reconsider this since the same criteria as those used for the carbon calculation of commercial harvest should be used where a biomass expansion factor is applied.

Non-key categories

Biomass burning – CO_2, CH_4 and N_2O

101. In the 2006 NIR, Spain states that emissions from forest fires were not reported because no land-use change happens as a result, but it remarks that it is evaluating the possibility of including emissions from forest fires. The ERT recommends Spain to include CO_2 and non-CO_2 emissions from forest fires in its future submissions, as recommended in the IPCC good practice guidance for LULUCF, since data on the area of forest fires are available.

9. Waste

Sector overview

102. In 1990, the largest contributions to emissions in the waste sector came from CH_4 from solid waste disposal sites (SWDS), followed by wastewater handling, which were both identified as key categories in 1990. Recalculations performed have increased the level of estimated emissions from the

waste sector in the base year by 5.7 per cent in terms of CO_2 equivalent compared with the estimates reported in the 2005 submission. During the review Spain also presented additionally recalculated estimates for emissions from SWDS (these were already included in Spain's 2007 submission) and these were discussed and agreed upon with the ERT. Spain provided new data and additional information from surveys carried out for managed landfills to support these revised estimates, which constitute a substantial improvement on the data and compared to the estimates provided as part of the 2006 inventory submission. These revised estimates changed total estimated emissions from the SWDS category in the base year from 4,065.57 Gg CO_2 equivalent as originally reported by Spain in its 2006 submission to 4,279.40 Gg CO_2 equivalent in its revised submission. In addition, following the in-country visit, Spain revised its estimates from waste incineration in that it removed CH_4 and N_2O emission estimates from open burning of agricultural wastes which it had reported under waste incineration in its 2006 inventory as originally submitted (see para. 108). Both the revised estimates for the SWDS category and those for waste incineration were included in the revised inventory submission that Spain provided after the in-country review. As a result of these improvements, estimated emissions from the waste sector increased for the base year from 7,548.87 Gg CO_2 equivalent as originally reported to 7,608.01 Gg CO_2 equivalent in the revised submission (i.e. an increase by 0.78 per cent); hence the overall recalculations for the base year compared to the 2005 submission resulted in an increase of estimated sectoral emissions by 6.5 per cent.

103. The CRF presents complete information on the sector, that is, estimates for all categories and the whole time series from 1990 to 2004; the recalculations undertaken have significantly improved the inventory compared to the 2005 submission. The ERT did, however, identify a lack of QC/QA procedures in the waste sector and in the assessment of uncertainties according to the IPCC good practice guidance. For some AD and EFs provided in the CRF and the NIR the Party was not able to provide sufficient background information during the review, for example, for the values for degradable organic carbon (DOC) from wastewater sludge from treatment plants, and this reduces the transparency of the emission estimates. Spain plans to improve its database and to develop its data acquisition by improving its data-gathering channels and quality controls for this sector, involving the General Sub-directorate for Waste Prevention, the administrative unit competent for waste treatment processes within the Ministry of Environment, more deeply. The ERT strongly recommends better coordination among the relevant institutions in the waste sector. The 2006 NIR presents improved information on emissions from landfills, but the characterization of the solid waste composition needs to be updated, and the data used for gas capture from landfills need to be improved.

Key categories

Solid waste disposal on land – CH_4

104. The methodology used for this category, following the tier 2 methods suggested by the IPCC good practice guidance, is appropriate. The EFs have been calculated by combining country-specific data and default factors suggested by the IPCC good practice guidance. The AD come from two sources: specific individualized questionnaires administered to the landfill sites with energy recovery; and the landfill statistics data published in the yearbook *Medio Ambiente en España* for the remaining landfill sites. For uncontrolled landfills, the Party was not able to provide sufficient additional background information during the review to support the assumptions made with regard to the amount of waste burnt and the depths of the landfills. The assumptions are conservative in the sense that they would probably not lead to an overestimation of estimates for the base year. The ERT therefore did not request correction and/or additional clarification as part of this review. However, it recommends the Party to improve the factors used and to improve the evidence for the assumptions used in its future submissions. Spain should also improve the data on waste composition and may draw on the data prepared under the new EU regulation on waste statistics for this purpose in future.

Wastewater handling – CH_4

105. The CH_4 emissions from wastewater handling come from domestic and industrial wastewater treatment plants and include the emissions from liquids and sludge. To estimate them, Spain has used the tier 2 methods suggested by the IPCC good practice guidance. The AD are based on expert judgement and statistical data from the sector. In relation to the EF, the default proposed by the IPCC good practice guidance has been used.

Non-key categories

Wastewater handling – N_2O

106. Spain has followed the default methods provided by the IPCC good practice guidance for estimating N_2O emissions from human excretion, and the AD and EFs were derived using data from the Ministry of Agriculture, Fisheries and Food and with the very final parameter of the EF (namely, kg N_2O-N/kg sewage N produced) taken from the Revised 1996 IPCC Guidelines.

Waste incineration – CO_2

107. The most important contribution to CO_2 emissions in this category comes from flaring in ferrous metallurgy, which contributed 665.71 Gg of the total 750 Gg CO_2 reported for this category. Spain has allocated emissions from flaring of gases (coke oven gas and blast furnace gas) under waste incineration – flaring in ferrous metallurgy. These CO_2 emissions occasionally occur in single years when some iron and steel plants are not able to sell the blast furnace gas produced. The ERT believes that this allocation to the waste sector is not appropriate, as the IPCC good practice guidance for the waste sector explains that this category should cover the incineration of municipal solid waste, hazardous waste, clinical waste or sewage sludge in specific waste incineration plants, which does not include flaring of gases. The ERT therefore recommends Spain to report and specify CO_2 emissions from the flaring of blast furnace gas in the category iron and steel production under the subcategory other (2.C.1.5) (CRF table 2(I).A-G). The IPCC good practice guidance moreover recommends reporting CO_2 emissions from blast furnace gas in the industrial processes sector.

Waste incineration – CH_4, N_2O

108. Spain also reports under the category waste incineration CH_4 and N_2O emissions from "open burning of agricultural wastes", amounting to 154.68 Gg CO_2 equivalent in 1990. The ERT found the amounts of burnt material to be rather large; during the review, however, it was not possible to define precisely the types of residue that are burnt or to confirm that these are agricultural residues (as distinct from forestry residues). The ERT therefore recommended that Spain justify the origin of these residues burnt and, if necessary, reconsider the allocation of these emissions to the appropriate sector of the inventory. In conjunction with its resubmission, Spain informed the ERT that these residues are considered forestry residues and had therefore been removed from the waste sector. This resulted in a decrease of the estimate of waste incineration emissions by 16.9 per cent (154.68 Gg CO_2 eq.) in the base year compared to the estimate originally reported (i.e. from 916.87 Gg CO_2 equivalent to 762.19 Gg CO_2 eq. in the revised resubmission).

C. Calculation of the assigned amount

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

110. Spain's base year is 1990 and the Party has chosen 1995 as its base year for HFCs, PFCs and SF_6. Spain's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol. As Spain is part of the European Community, whose member States will meet their reduction commitment jointly in accordance with Article 4 of the Kyoto Protocol, Spain's quantified emission

limitation is 115 per cent. Spain's assigned amount is calculated based on the Party's Article 4 commitment.

111. Based on Spain's original estimate of base year emissions, excluding land-use change – 289,385.64 Gg CO_2 equivalent – and its Kyoto Protocol target of 115 per cent, the Party calculated its assigned amount to be 1,663,967,412 tonnes CO_2 equivalent.

112. In response to inventory issues identified during the review Spain submitted revised estimates of its base year inventory (289,773.21 Gg CO_2 eq.), which resulted in a recalculation of the assigned amount. Based on the revised estimates, Spain calculates its assigned amount to be 1,666,195,929 tonnes CO_2 equivalent. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

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

114. Based on its original calculated assigned amount – 1,663,967,412 tonnes CO_2 equivalent – Spain calculated its commitment period reserve to be 1,497,570,670 tonnes CO_2 equivalent.

115. In response to inventory issues identified during the review, Spain submitted revised estimates of its base year inventory, which resulted in a recalculation of the commitment period reserve. Based on the revised estimates of the base year – 289,773.21 Gg CO_2 equivalent – and the calculated assigned amount of 1,666,195,929 tonnes CO_2 equivalent, Spain calculates its commitment period reserve to be 1,499,576,336 tonnes CO_2 equivalent. The ERT agrees with this figure.

E. National registry

116. Spain has provided all the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). The information provided is broadly transparent and in accordance with the requirements of the reporting guidelines.

117. During the initial review, the ERT was provided with additional and updated information on the national registry of Spain. Upon request by the ERT, Spain provided a revised version of its initial report, in which all the updated information that was provided to the ERT during the review has been included.

118. Table 5 summarizes the information on the mandatory reporting elements on the national registry system, as stipulated by decisions 13/CMP.1 and 5/CMP.1 which describes how the national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1.

119. During the in-country visit, the ERT was informed that the internal operational test of the registry for network connection was completed on 20 April 2007. The initialization process was expected to be completed by 20 June 2007 and the registry to be fully operational by September 2007. Information on the registry is publicly available through the Internet at URL <http://www.renade.es>.

120. The ERT was also informed about the procedures and security measures to minimize discrepancies, terminate transactions and correct problems, and minimize operator error.

121. The ERT acknowledged the effort made by Spain to put in place these adequate procedures and security measures, and especially the geographical separation of the production and backup environments and the firewall that is in place. The ERT gained the overall impression that Spain attaches adequate importance, and allocates adequate resources, including human resources, to the development, operation and maintenance of the registry.

122. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report (IAR) that was forwarded to the ERT by the administrator of the international transaction log pursuant to decision 16/CP.10, on 8 October 2007.

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

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

Table 5. Summary of reporting on the national registry system

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

[a] Spain cooperates with other member states of the European Union within the European Community independent transaction log (CITL).

[b] Pursuant to decision 16/CP.10, once registry systems become operational, the administrator of the international transaction log (ITL) is requested to facilitate an interactive exercise, including with experts from Parties to the Kyoto Protocol not included in Annex I to the Convention, demonstrating the functioning of the ITL with other registry systems. The results of this exercise will be included in an independent assessment report (IAR). They will also be included in its annual report to the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

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

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

Table 6. Selection of LULUCF parameters

Parameters for forest definition		
Minimum tree cover	20%	
Minimum land area	1 ha	
Minimum tree height	3 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3 activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4 activities		
Forest land management	Elected	Commitment period
Cropland management	Elected	Commitment period
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

126. The parameters chosen for the definition of forest are within the agreed values in decision 16/CMP.1. Where tree crown cover is concerned, the definition of 20 per cent differs from that which Spain uses for reporting to the FAO, which is 10 per cent. In its revised initial report, Spain explains the choice for this definition, which is compatible with the data submitted to the FAO and considered to be conservative (see also para. 96 above).

III. Conclusions and recommendations

A. Conclusions

127. The ERT concluded that the information provided by Spain in its revised initial report is complete and submitted in accordance with the relevant provisions of paragraphs 5, 6, 7 and 8 of the annex to decision 13/CMP.1, section I of the annex to decision 15/CMP.1, and relevant decisions of the CMP; that the assigned amount pursuant to Article 3, paragraphs 7 and 8, is calculated in accordance with the annex to decision 13/CMP.1, and is consistent with the revised inventory estimates as submitted and reviewed; and that the calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1, and the LULUCF definitions are within the agreed range.

128. Spain's national system has generally been developed in line with the guidelines for national systems (decision 19/CMP.1). The DGCEA of the Ministry of Environment is the designated single national entity. Overall, the ERT considers that the national system can fulfil the requirements of the Kyoto Protocol.

129. The inventory has been compiled in accordance with Article 7, paragraph 1, and decision 15/CMP.1 insofar as the initial report is concerned. Spain has submitted a complete set of CRF tables for the years 1990–2004 and an NIR. The inventory is generally in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance and is complete in terms of years, geographic coverage, sectors and gases, except for the LULUCF sector. During the in-country review the Party and the ERT agreed on some changes to be made for some categories in the energy, agriculture and waste sectors. There was no need for adjustments.

130. Based on Spain's base year emissions – 289,773,205 tonnes CO_2 equivalent, including the revised estimates provided in the energy, agriculture and waste sectors – and its Kyoto Protocol target – 115 per cent – the Party calculates its assigned amount to be 1,666,195,929 tonnes CO_2 equivalent. Spain calculates its commitment period reserve to be 1,499,576,336 tonnes CO_2 equivalent. Both the results for the assigned amount and the commitment period reserve are also reported in Spain's revised initial report. The ERT agrees with these figures.

131. Spain's choice of the parameters to define forest (minimum tree cover: 20 per cent; minimum land area: 1 ha; minimum tree height: 3 metres) are in accordance with the range specified in decision 16/CMP.1. Spain has elected forest land management and cropland management as activities under Article 3, paragraph 4, of the Kyoto Protocol. Accounting will be made at the end of the commitment period for the Article 3, paragraph 3, and elected Article 3, paragraph 4, activities.

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

B. Recommendations

133. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of Spain's information presented in the initial report and its 2006 GHG inventory submission. The key recommendations[3] are that Spain:

(a) Implement further improvements in institutional cooperation and administrative arrangements, in particular in the energy and LULUCF sectors, and strengthen the establishment and the work of the relevant formal working groups that have been established;

(b) In the energy sector: further improve institutional cooperation to resolve and explain identified inconsistencies in consumption data for some liquid fuels, and get access to the plant-specific data reported under the EU ETS;

(c) In the LULUCF and agriculture sectors: further improve institutional cooperation between the relevant ministry departments and institutions contributing to the inventory of these sectors in order to enhance consistency in the data used for the preparation of inventory estimates, for example, by developing a national land-use classification, as already planned. Spain should also provide estimates for the LULUCF categories presently not reported;

(d) Enhance QA/QC in those sectors where some weaknesses have been identified, that is, mainly the waste and LULUCF sectors;

(e) Encourage participation of the autonomous regions in the formal working groups and develop legal arrangements to enable the use of the plant-specific data collected under the EU ETS for QA/QC purposes of the GHG inventory;

(f) Complete the reporting of the CRF tables, in particular the tables related to LULUCF, table 9 (completeness) and table 8(b) (recalculations), in its next submission;

(g) Include in the NIR the references of the AD and EF sources and the list of references.

C. Questions of implementation

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

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

Annex I

Documents and information used during the review

A. Reference documents

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

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

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

UNFCCC. Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories. FCCC/SBSTA/2004/8. Available at <http://unfccc.int/resource/docs/2004/sbsta/08.pdf>.

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

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

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

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

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

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

UNFCCC secretariat. Spain: Report of the individual review of the greenhouse gas inventory submitted in the year 2005. FCCC/WEB/IRI/2005ESP. Available at <http://unfccc.int/resource/docs/2006/arr/esp.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from various relevant departments through Ms. Angeles Cristobal from the Directorate-General for Quality and Environmental Evaluation, Sub-Directorate for Air Quality and Risk Prevention of the Ministry of Environment, including additional material on the methodology and assumptions used as well as background information and

additional documentation on institutional arrangements, including the national system and the registry, as follows.

National registry

Convenio entre el Ministerio de Medio Ambiente e Iberclear en relación con el Registro Nacional de Derechos de Emisión (RENADE).

Extract from the report to the European Commission under article 21 of Directive 2003/87/EC.

Orden MAM/1445/2006, de 9 de mayo, sobre tarifas del Registro Nacional de Derechos de Emisión.

Real Decreto 1264/2005 de 21 de octubre, por el que se regula la organización y funcionamiento del Registro Nacional de Derechos de Emisión.

Resolución de 21 de octubre de 2005, de la Secretaría General para la Prevención de la Contaminación y del Cambio Climático, por lo que se da publicidad al Acuerdo de Consejo de Ministros, de 19 noviembre de 2004, por el que se encomienda la llevanza del Registro Nacional de derechos de emisión a la Sociedad de Gestión de los Sistemas de Registro, Compensación y Liquidación de Valores, S.A.

UNFCCC International Transaction Log, Registry System Initial Questionnaire.

National system

Acuerdo por el que se establecen los mecanismos de obtención de información para la aplicación en España del sistema de inventario nacional de emisiones contaminantes a la atmósfera, de la Comisión Delegada del Gobierno para asuntos económicos en su reunión del día 8 febrero 2007.

Disposición Adicional Cuarta de la Ley 4/1990, de 29 de junio, de Presupuestos Generales del Estado para 1990.

Ley 12/1989, de 9 de mayo de 1989, de la Función Estadística Pública (BOE 11-05-1989).

Orden MAM/1446/2006 de 9 de mayo, por la que se designa a la Dirección General de Calidad y Evaluación Ambiental del Ministerio de Medio Ambiente como Autoridad Nacional del Sistema de Inventario Nacional de Emisiones Contaminantes a la Atmósfera.

Proyecto le Ley 121/000122, Calidad del aire y protección de la atmósfera, de 2 de febrero 2007.

Real Decreto 1911/2004, de 17 de septiembre, por el que se aprueba el Plan Estadístico Nacional, 2005–2008.

GHG inventory

*Anuario estadístico agrario 2004**.

Calculating Direct GHG Emissions from Primary Aluminium Metal Production, guide to calculation worksheets.

Directive of the Council of May 21 1991 on treatment of the residual urban (91/271/CEE) waters consolidated. TEXTO. Office of Official Publications of the European Communities.

Estudio de información básica para la determinación de emisiones a la atmósfera producidas por biodegradación de Residuos Sólidos. Prointec INC, Nov 1999*.

Ministerio de Agricultura, Pesca y Alimentación and Ministerio de Medio Ambiente. 2006. Guías de mejoras técnicas disponibles (available at <http://www.mapa.es/es/ganaderia/pags/IPPC/IPPC.htm#inicio>):
– del sector porcino;
– del sector de la avicultura de puesta*;
– del sector de al avicultura de carne*.

Ministerio de Medio Ambiente, Secretaría General para la Prevención de la Contaminación y del Cambio Climático, Dirección General de Calidad y Evaluacion Ambiental. Inventarios Nacionales de emisiones a la atmósfera 1990–2004 (in electronic format/CD), July 2006:
– Documento Resumen;
– Volumen I: Planteamiento, Metodología General y Síntesis de Resultados;
– Volumen II: Análisis por actividades emisoras de la nomenclatura SNAP.

Ministerio de Medio Ambiente and Universidad Politecnica de Valencia. 2006. Methodology to estimate atmospheric emissions from the agrarian sector for the national emissions inventory. October.

Sector residuos: additional information in relation to the NIR 2007 (informal document provided for the ERT).

The Environment in Spain, Annual, 2003*.

The following additional supplementary information was provided in conjunction with the resubmission of 8 June 2007 (informal documents provided to the ERT):
– Aclaraciones sobre el inventario (clarifications on the inventory)
– Specific files on specific activities:
  • Aclaraciones Residuos 6A - Suplemento (WORD);
  • Air Traffic - Supplement (EXCEL);
  • Aclaraciones Agricultura - Suplemento (EXCEL);
  • Modelo Cuestionario Vertederos Individualizados (EXCEL).

* Only consulted during the visit.

Annex II

Acronyms and abbreviations

AD	activity data
AED	Análisis Estadistico de Datos, S.A
ANAVE	Asociación de Navieros Españoles
AWMS	animal waste management system
BEF	biomass expansion factor
Bo	methane producing capacity
BOD	biochemical oxygen demand
CH_4	methane
CITL	community independent transaction log
CMP	Conference of the Parties serving as the Meeting of the Parties
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
D	wood density
DGCEA	General Directorate of Quality and Environmental Evaluation
EC	European Community
EF	emission factor
EIT	economy in transition
ERT	expert review team
ETS	emissions trading scheme
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GJ	gigajoule (1 GJ = 10^9 joule)
GWP	global warming potential
HFCs	hydrofluorocarbons
IAR	independent assessment report
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane conversion factor
Mg	megagram (1 Mg = 1 tonne)
$MgCO_3$	magnesium carbonate
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NFI	National Forest Inventory
NIR	national inventory report
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
SWDS	solid waste disposal site
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule
UNFCCC	United Nations Framework Convention on Climate Change
VS	volatilized solids excretion

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