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Report of the review of the initial report of Poland

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 Poland conducted by an expert review team in accordance with Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Poland, 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 11 to 16 June 2007 in Warsaw, Poland, and was conducted by the following team of nominated experts from the roster of experts: generalist – Ms. Barbara Muik (Austria); energy – Mr. Matej Gasperic (Slovenia); industrial processes – Mr. Justin Goodwin (United Kingdom); agriculture – Ms. Batima Punsalmaa (Mongolia); land use, land-use change and forestry (LULUCF) – Mr. Risto Sievanen (Finland); waste – Mr. Eduardo Calvo (Peru). Mr. Justin Goodwin and Mr. Eduardo Calvo were the lead reviewers. In addition, the expert review team (ERT) reviewed the national system, the national registry, and the calculations of Poland'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 Mr. Javier Hanna (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 Poland, 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 the 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 of Poland was submitted on 29 December 2006, which is in compliance with decision 13/CMP.1. With the initial report Poland submitted a greenhouse gas (GHG) inventory for 1988 and 1989 in addition to its original 2006 GHG inventory submission of 15 April 2006 which contained the year 2004. Poland submitted a revised version of the 2006 GHG inventory submission on 29 March 2007, which covered 1990–2004. After the in-country review, Poland submitted revised emission estimates and documentation as well as additional information on 27 July 2007 in response to questions raised by the ERT during and after the in-country review, which are considered in this review report, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP1). Poland submitted final revised estimates for the entire time series on 14 November 2007. The ERT appreciates all the hard work of Poland in trying to improve the inventory estimates and to deliver all the additional documentation, explanations and information requested by the ERT after the in-country review.

2. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report as well as revised calculations for the assigned amount and commitment period reserve (CPR) provided by Poland as a result of the review process. These revised calculations are based on the inclusion of new estimates and revisions of estimates under the energy, industrial processes, agriculture and waste sectors (see paragraph 28), which resulted in revisions of the total GHG emissions, including base year emissions, from the 586,902,634 tonnes carbon dioxide (CO_2) eq. as reported originally to 563,442,774 tonnes CO_2 eq. (see paragraphs 158 and 159) and revisions of the estimates of the 2004 inventory from the 396,650,643 tonnes CO_2 eq. as originally reported to 388,482,155 tonnes CO_2 eq. (see paragraphs 161 and 162).

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 (1988) to the most recent year available (2004)	Yes	Base year: 1988
Base year for HFCs, PFCs and SF_6	Yes	1995
Agreement under Article 4	No	Not applicable
LULUCF parameters	Yes	Minimum tree crown cover: 10% Minimum land area: 0.1 ha Minimum tree height: 2 m
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	Forest management Commitment period accounting
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	2,758,442,380 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised estimate		2,648,181,038 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	1,942,364,425 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised estimate		1,942,410,776 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	Lacks completeness and transparency (see paragraph 5 and paragraph 7)
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	

5. The information in the initial report generally covers all the elements 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, during the in-country review the ERT found some incomplete elements relating to the national system and in particular to the description in the initial report of the quality assurance/quality control (QA/QC) plan that has not yet been developed and implemented and the institutional, legal and procedural arrangements. During the in-country review, Poland provided further explanations of the institutional, legal and procedural arrangements and provided a QA/QC plan.

6. The 2006 GHG inventory of Poland contains a complete set of common reporting format (CRF) tables for the years 1988–2004 and a national inventory report (NIR) for each reported year. In the CRF tables, Poland included data on all relevant gases, sectors and categories. The inventory is complete in terms of geographic coverage.

3. Transparency

7. The initial report is generally transparent, but lacks transparency in the description of the national system, particularly in the description of the legal and procedural arrangements, the QA/QC plan, key source identification and recalculations. The ERT further found that the transparency of the inventory information contained in the NIR and the CRF tables is limited. During the review, the ERT identified the following areas where transparency needs to be further enhanced: submission of a single NIR covering the entire time series and following the structure recommended 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" (hereinafter referred to as the UNFCCC reporting guidelines); inclusion of more comprehensive and precise methodological descriptions in the NIR in all

sectors; information on cross-cutting issues such as complete information on recalculations (value changes, and rationales in the general and sectoral chapters); and systematic use of notation keys in CRF tables.

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

8. In the base year (1988 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the most important GHG in Poland was CO_2 contributing 83.3 per cent to total[1] national GHG emissions expressed in CO_2 eq.,[2] followed by methane (CH_4), 9.5 per cent and nitrous oxide (N_2O), 7.2 per cent (see figure 1). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6) taken together contributed 0.05 per cent of the overall GHG emissions in the base year. The energy sector accounted for 83.5 per cent of the total GHG emissions in the base year followed by agriculture 9.0 per cent, industrial processes 5.8 per cent, waste 1.5 per cent and solvents and other product use 0.2 per cent (see figure 2). Total GHG emissions (excluding LULUCF) amounted to 563,442.77 Gg CO_2 eq. in the base year and decreased by 31.0 per cent from the base year to 2004. The trends are considered reasonable given the overall economic development of Poland. However, the ERT notes the lack of explanation for the trends in the NIR and recommends Poland to include such information in its future submissions.

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

[2] In this report, the values for total and sectoral emissions for the entire time series, and in particular in the base year and in 2004 reflect the revised estimates submitted by Poland in the course of the review. These estimates differ from Poland's GHG inventory submitted in 2006.

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

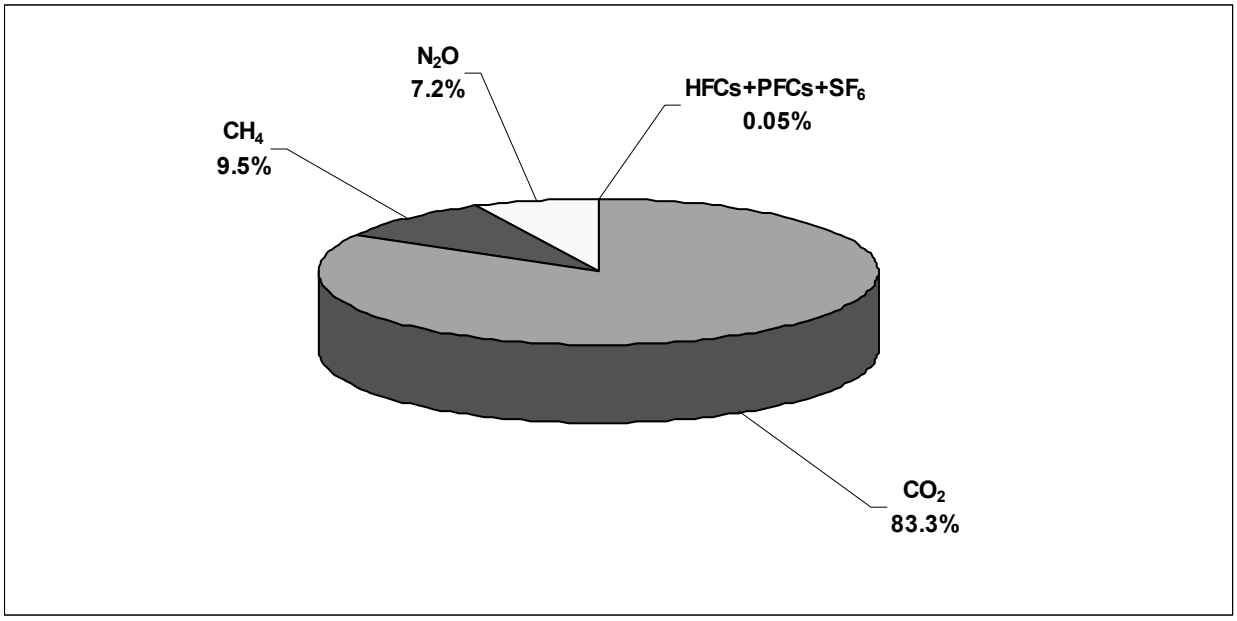
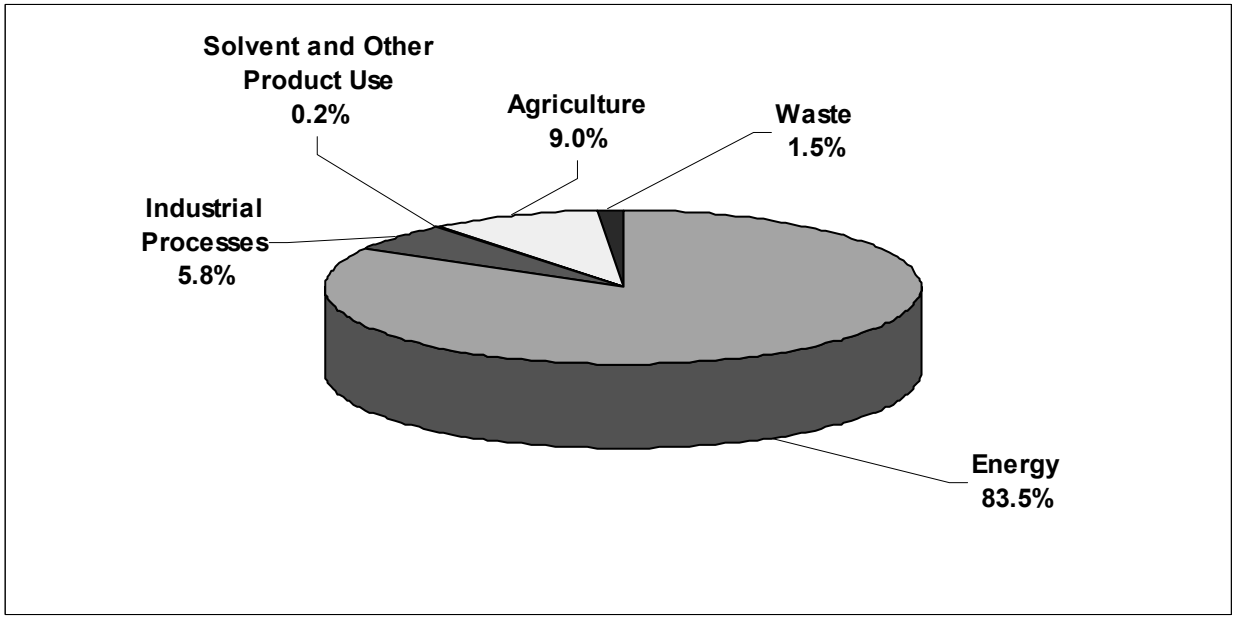


Figure 2. Shares of sectors in total GHG emissions, base year



9. Tables 2 and 3 show the GHG emissions by gas and by sector, respectively.

10. Poland's quantified emission reduction commitment is 94 per cent as included in Annex B to the Kyoto Protocol.

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

GHG emissions (without LULUCF)	Gg CO_2 equivalent								Change
	Base year[a]	1990[a]	1995[a]	2000[a]	2001[a]	2002[a]	2003[a]	2004[a]	BY–2004 (%)
CO_2	469 143,82	377 160,79	363 736,62	320 090,18	320 900,43	307 804,86	320 270,82	319 470,10	–31,9
CH_4	53 665,03	47 910,08	43 328,60	39 177,78	38 342,59	37 634,40	38 326,55	37 842,49	–29,5
N_2O	40 333,53	37 565,16	30 841,85	29 504,71	29 594,49	28 114,59	28 211,50	28 436,30	–29,5
HFCs	26,44	0,00	26,44	594,67	1 073,35	1 519,44	1 816,23	2 425,13	9 071,7
PFCs	250,18	0,00	250,18	224,40	269,95	286,50	278,34	285,05	13,9
SF_6	23,77	0,00	23,77	21,12	21,81	23,21	20,94	23,09	–2,8

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

[a] Poland submitted revised estimates for the entire time series in the course of the initial review on 14 November 2007. These estimates differ from Poland's GHG inventory submitted in 2006.

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

Sectors	Gg CO_2 equivalent								Change
	Base year[a]	1990[a]	1995[a]	2000[a]	2001[a]	2002[a]	2003[a]	2004[a]	BY–2004 (%)
Energy	470 309,06	379 049,84	367 062,86	322 388,12	325 091,52	312 027,63	323 492,66	322 246,64	–31,5
Industrial processes	32 832,19	24 545,58	23 505,33	22 829,18	20 974,94	19 534,25	22 456,57	23 715,58	–27,8
Solvent and other product use	1 006,46	629,23	524,80	616,09	637,21	664,25	647,39	704,67	–30.0
Agriculture	50 893,90	49 748,18	37 813,00	34 589,77	34 213,23	33 798,73	33 018,11	32 368,33	–36,4
LULUCF	–32 926,48	–32 721,66	–32 781,68	–28 043,22	–31 066,73	-28 490,51	–25 647,36	–26 723,32	–18,8
Waste	8 401,16	8 663,20	9 301,47	9 189,71	9 285,73	9 358,13	9 309,65	9 446,94	12,4
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	429 914,37	405 425,79	361 569,64	359 135,90	346 892,47	363 277,02	361 758,83	NA
Total (without LULUCF)	563 442,77	462 636,03	438 207,47	389 612,86	390 202,63	375 382,99	388 924,38	388 482,16	–31,1

Note: BY = base year; LULUCF = land use, land-use change and forestry; NA = not applicable.

[a] Poland submitted revised estimates for the entire time series in the course of the initial review on 14 November 2007. These estimates differ from Poland's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

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

11. Poland's national system is generally in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). However, during the in-country review the ERT noted that enhancements are needed to the three general functions of the national system: planning, preparation and management. Specifically, further improvements are needed in the following areas: greater transparency in reporting the GHG inventories, further development of QA/QC and archiving procedures. In response to these concerns, after the in-country review, Poland provided documentation showing that this further development is already in progress.

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

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

Reporting element	Provided	Comments
Inventory planning		
Designated single national entity*	Yes	See section II.A.1
Defined/allocated specific responsibilities for inventory development process*	Yes	See section II.A.1
Established process for approving the inventory*	Yes	See section II.A.1
Quality assurance/quality control plan*	No	See section II.A.2
Ways to improve inventory quality	No	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.2
Quantitative uncertainty analysis*	Yes	See section II.B.2
Recalculations*	No	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	No	See section II.A.2
Inventory management		
Archive inventory information*	No	See section II.A.3
Archive at single location	No	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

13. The initial report identifies the single national entity, but not the legal basis for its work or the work of collaborating institutes. It includes the roles and responsibilities of various agencies and entities, a description of the process for inventory preparation and a description of the procedures for the official consideration and approval of the inventory. During the in-country review, Poland further explained the institutional arrangements, as part of the national system, for preparation of the inventory. The National Emission Centre (NEC) is the designated single national entity. Since late 2000, the NEC has been

commissioned by the Ministry of Environment (MoE) (on a yearly contract basis) to carry out national emission inventories for the GHGs and other air pollutants. In early 2006, the NEC and its tasks became part of the National Administration of the Emissions Trading Scheme, located at the Institute of Environmental Protection (IEP) in Warsaw. The legal basis for the establishment of the IEP as the National Administration of the Emissions Trading Scheme is the Ordinance of 13 September 2005 to the Act of 22 December 2004 (Art. 9) on the emission allowance trading system for GHG and other substances. A contract with the MoE defines the tasks of the NEC as compiling and submitting GHG inventories. The contents of this contract will be transformed to an act (Act on Instruments Supporting the Reduction of GHG Emissions and Other Substances) to further strengthen the legal basis of NEC's work. A draft version of this act was provided to the ERT. The ERT considers that the legal basis for the national system in Poland is sufficient and workable.

14. The emission calculation, and the choices of activity data (AD), emission factors (EFs) and methodology are performed by the NEC staff. Other organizations are also involved in the preparation of the inventory, mainly providing AD for the inventory estimates. Data providers are Ministries or other official bodies that are obliged to prepare and provide statistical data within the national programme of statistical studies defined by law. Data flow goes through the MoE which requests for information using formal letters are prepared by the NEC. Among the main data suppliers are: the Energy Market Agency (ARE) (energy sector); the Central Statistical Office (GUS) (AD in all sectors); the Institute of Automobile Transport (ITS); and the Office for Forest Planning and Management (BULiGL) (forest inventory). Other data providers include private bodies, representatives of industrial sectors, and chambers of commerce, where data is provided on a voluntary basis. At the moment, the main institutions that are involved in inventory preparation are not formally linked to the national system. The ERT noted that the formal link between the collaborating institutions and the national system will be established by the Act on Instruments Supporting the Reduction of GHG Emissions and Other Substances.

15. The NEC, as part of the IEP, has access to the individual data of entities from the European Union Emission Trading Scheme (EU-ETS). This ensures the availability of data for major sources in the stationary fuel combustion sectors (1.A.1 and 1.A.2) and the industrial processes sector. There is a special arrangement with GUS under which the NEC can obtain preliminary data before they are published and has access to statistical data at various levels of disaggregation that are not officially published. However, the NEC does not have access to confidential statistical data. The ERT encourages Poland to strengthen its institutional arrangements with a further agreement with GUS in order to ensure data availability for complete coverage of all possible emission sources.

16. As is mentioned above, the initial report did not identify the legal basis for the work of the NEC or the institutional and legal arrangements with the collaborating institutions, but this information was provided by Poland during the in-country review. In reaction to the recommendations made by the ERT after the in-country review, Poland also provided a copy of the contract with the MoE that defines the tasks of the NEC. After considering all the information provided by Poland, the ERT concludes that the legal, procedural and institutional arrangements of the existing national system in Poland are sufficient for preparing reliable GHG inventories. The ERT noted that the arrangements will become more effective and reliable and ensure timely performance of the functions of the national system once the Act on Instruments Supporting the Reduction of GHG Emissions and Other Substances is adopted. The ERT expects that all relevant arrangements for the national system will be included in the adopted act and recommends that information on this important legal arrangement be included in Poland's next submission under the Kyoto Protocol.

17. The legal basis for carrying out the forest inventory of all forests, which provides data for inventory of the LULUCF sector, is provided by the Forest Act (28 September 1991). A comprehensive forest and other land area inventory, run by the State Forest Institute, was set up in 2005 and will be fully functional by 2009. An extensive research programme is under way, which will provide data and

parameters for the inventory of the LULUCF sector. The ERT concluded that reporting of article 3, paragraphs 3 and 4, activities can be carried out on the basis of data produced by the existing reporting system for LULUCF given the planned improvements.

18. In Poland 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 inventory reviews. The responsible organization is the MoE. The inventory is sent to the Ministry for consideration prior to submission and approved in a formal process during the annual closure meeting held under the contract between the NEC and the MoE. Minutes of the last approval meeting (12 December 2006) were provided to the ERT during the in-country review.

2. Quality assurance/quality control

19. In its initial report, Poland indicates that it has not yet implemented a formal QA/QC procedure, including a verification plan, for the national GHG inventory. In the initial report and the NIR Poland states that general and sector-specific QC procedures are performed regularly and that QA-related activities referred to external reviews are performed occasionally under the auspices of the MoE. The draft inventory data are usually checked by NEC experts and consultations with data providers are undertaken. Before the data are forwarded to the UNFCCC secretariat, the MoE and the Main Inspectorate for Environmental Protection carry out an additional review. However, during the in-country review the ERT noted that the results of QC checks and reviews are not well documented and archived. The ERT therefore suggested that Poland introduce better documentation of its QC activities at all stages of inventory preparation within the NEC, as well as for the other institutes/experts that contribute to inventory preparation, and in calculation spreadsheets and other supporting documents.

20. At the request of the ERT, Poland provided a draft QA/QC plan during the in-country review. However, the ERT considered this plan to be too general and insufficient to ensure the quality of the GHG inventory. Therefore, the ERT requested Poland to provide a more detailed draft of its QA/QC plan. In reaction to the recommendations made by the ERT after the in-country review, Poland provided the ERT its National Programme for Quality Assurance and Quality Control. After the in-country review (13 December 2007) Poland provided the ERT with a letter from the Ministry of Environment to KASHUE with the formal approval of the Poland's QA/QC Plan. This programme contains all the relevant elements such as general and specific QC procedures, QA procedures, a timetable for inventory preparation and QA/QC, defined responsibilities for inventory preparation and QA/QC, and tier 1 and tier 2 QC checklists. The ERT considers the programme to be in line with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and expects that it will be implemented by Poland. Poland additionally provided a summary of implemented QA/QC activities for its 2006 inventory submission.

21. The ERT encourages Poland to document QA/QC activities in the NIRs of its future submissions in accordance with the UNFCCC reporting guidelines; to use review findings to improve the inventory and to archive the findings/results of the QA/QC procedures together with the inventory data.

3. Inventory management

22. Poland has a centralized archiving system that is located at the NEC, which includes the archiving of disaggregated EFs, AD, and documentation on how these EFs and AD have been generated and aggregated for the preparation of the inventory. The archived information also includes documentation on annual key categories, key category identification and uncertainties, but does not include internal documentation on QA/QC procedures, external and internal reviews, and planned inventory improvements. During the in-country review, the ERT was provided with the additional archived information it requested. However, the ERT noted that the archiving system did not fully comply with the requirements of the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol. Poland put a lot of effort into improving the archiving system following the

recommendations of the ERT. During the in-country review, the ERT requested Poland to provide a procedural manual for the management and maintenance of the archiving system, including information on the structure, the content of different sections, responsibilities, access rights and other relevant information. The ERT also requested that Poland further develop its archiving system in relation to security, electronic organization of files, storage of supporting information and a proper indexing system. After the in-country review, the manual requested was provided to the ERT. It included all relevant information on the electronic data management system as well as on back-up, the security of data stored, and electronic organization of files, including storage of supporting information. The ERT considers that the manual includes all the required information on electronic data management with the exception of documentation on QA/QC procedures, but does not describe the archiving and indexing of hard copies.

23. The ERT recommends Poland to maintain its established electronic archiving system and to use a robust library system for both electronic and hard copies of literature, correspondence, calculation sheets and any other information required to produce the national emission inventory estimates. The archiving system shall be extended to include internal documentation on QA/QC procedures, external and internal reviews and planned inventory improvements. The ERT recommends that Poland report the information on its archiving system in its next NIR.

B. Greenhouse gas inventory

24. In conjunction with its initial report, Poland has submitted CRF tables for the years 1988–2004 and 17 NIRs, one for each reported year. After the in-country review, in response to questions raised by the ERT during the course of the in-country review, Poland submitted its final version of revised CRF tables for the entire time series on 14 November 2007.

25. During the review, Poland provided the ERT with additional information sources. These documents are not part of the initial report submission but are in some cases referenced in the NIR. The full list of materials used during the review is provided in the annex to this report.

1. Key categories

26. Poland has reported a tier 1 key category analysis, both level and trend assessment, as part of its 2006 GHG inventory submission. Poland has not included the LULUCF sector in its key category analysis and did not apply a qualitative approach in determining its key categories.

27. The key category analysis performed by Poland and the secretariat[3] produced similar results, both for the base year and 2004. However, the fact that the LULUCF sector was not included in Poland's key category analysis resulted in some LULUCF categories being identified only by the secretariat in the base year, namely forest land remaining forest land, cropland remaining cropland and grassland remaining grassland. The Party's key category analysis guides the inventory preparation and is used to set priorities for the development of more advanced methodologies.

2. Cross-cutting topics

28. 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) and the IPCC good practice guidance and in general is compiled in accordance with Article 7, paragraph 1, and

[3] 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 Poland performed a key category analysis, the key categories presented in this report follow Poland's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

decision 15/CMP.1. However, the ERT identified a number of cases where the methods, AD and EFs used are not fully in line with the guidance mentioned above. These cases include, first, the incorrect use of AD, EFs or methodologies or their insufficient documentation: (a) the use of poorly documented country-specific oxidation factors for CO_2 emissions from solid fuels in the energy industries (1.A.1); (b) the inclusion of imported natural gas in the calculation of CH_4 and CO_2 emissions from natural gas processing (1.B.2.b.ii); (c) the inclusion of GHG emissions from non-energy products in the commercial/institutional category (1.A.4.a); (d) the use of poorly documented country-specific EFs for CO_2 emissions from coke, gasoline, fuel oil, coke oven gas, town gas, blast furnace gas and high methane natural gas in fuel combustion (1.A.); (e) the use of an assumed split between fuel for navigation (1.A.3.d) and marine bunkers, without supporting information on levels of international versus domestic shipping activity; (f) the inconsistency between total domestic coke supply in the energy balance and the sum of coke consumption used for the calculation of GHG emissions from coke in the relevant inventory categories (in particular fuel combustion (1.A.)); (g) the inconsistencies between total energy use of (high methane) natural gas, LPG and coke oven gas in the energy balance and the total energy use of (high methane) natural gas, LPG and coke oven gas used for the calculation of GHG emissions from fuel combustion (1.A.); (h) the EFs for CO_2 estimation from railways (1.A.3c); (i) the AD for CO_2 estimation from ammonia production (2.B.1); (j) the AD and EFs for CO_2 estimation from steel production (2.C.1); (k) the use of inconsistent data sources for milk production by dairy cattle for the calculation of CH_4 emissions from enteric fermentation (4.A.); (l) the use of total peat land area instead of cultivated peat area to calculate N_2O emissions from cultivation of histosols (4.D.1.5); (m) the use of poorly documented country-specific parameters for CH_4 emissions from solid waste disposal sites (6.A.); (n) the AD and method used for CH_4 emissions from for industrial wastewater (6.B.1); second, estimation of the LULUCF sector according to the Revised 1996 IPCC Guidelines instead of use of the IPCC good practice guidance for LULUCF; and, third, categories or gases that are not estimated, such as: CO_2 from underground mines (1.B.1.a.i) and surface mines (1.B.1.a.ii); CH_4 from post-mining activities in surface mines (1.B.1.a.ii); emissions of CO_2, CH_4 and N_2O from oil refining/storage (1.B.2.a.iv), distribution of oil products (1.B.2.a.v), natural gas – other leakage (1.B.2.b.v) and venting and flaring (1.B.2.c); CH_4 from other (industrial solid waste) (6.A.3); and CH_4 recovery from managed waste disposal on land (6.A.1).

29. Further details of the cases summarized above are provided in the respective sectoral sections of this report. The ERT acknowledges that most of these problems were corrected during the review and recommends Poland to reflect these improvements and changes in its next inventory submission.

Completeness

30. The 2006 inventory submission covers all years from the base year (1988) to 2004. Poland has included most of the tables required with data on all the relevant gases, sectors and main categories. The inventory is complete in terms of geographic coverage. Notation keys are used throughout the tables.

31. However, the ERT noted several categories for which GHG emissions occur in Poland but emissions have been reported as not estimated ("NE") (see paragraph 28). Poland explained that in such cases either not enough information was available or the emissions are considered to be minor. Moreover, Poland has not submitted complete CRF tables 8(a) and 8(b) (recalculations) and tables 9(a) and 9(b) (completeness), or explanations for the differences between the reference and sectoral approaches in table 1.A(c). There are also reporting gaps in some of the sectoral tables (e.g. potential emissions in the industrial processes sector) and information in table 7 (key categories) is not consistent with information provided in the NIR. In addition, some mandatory LULUCF categories, including land converted to forest land, land converted to cropland, and land converted to settlements, are reported as "NE". For other categories no notation keys were used (e.g. land converted to grassland and land converted to wetlands). The incompleteness of the reporting in the LULUCF sector is linked to the use of the Revised 1996 IPCC Guidelines, which is not in accordance with the IPCC good practice guidance and the latest UNFCCC reporting requirements. The ERT encourages Poland to provide estimates for all

categories where emissions occur in the country, even if they are minor, and to estimate emissions/removals from all mandatory LULUCF categories following the IPCC good practice guidance for LULUCF. The ERT noted the efforts made by Poland to solve most of the above mentioned problems in the course of the review, among others including estimates for CO_2 emissions from ammonia, steel and zinc production; CH_4 emissions from oil refining/storage, from other industrial solid waste and industrial wastewater; and SF_6 from magnesium casting as well as providing revised estimates for the LULUCF sector in accordance with the IPCC good practice guidance.

32. Although Poland submitted 17 NIRs (one for each inventory year), the NIR lacks some chapters that form part of the structure of the NIR recommended in the UNFCCC reporting guidelines, such as description and interpretation of emission trends, general and category-specific information on recalculations and improvements, and source/sink category-specific information on QA/QC, uncertainties and time-series consistency.

Transparency

33. The ERT noted that the transparency and quality of the information reported by Poland in the NIRs have improved since the previous (2005) submission. However, the ERT encourages Poland to provide one NIR (instead of the current 17) covering the entire time series and following the structure of the UNFCCC reporting guidelines (see paragraph 32 above). Furthermore, the ERT encourages Poland to improve the transparency of the inventory by including additional information in the NIR with regard to comprehensive and precise methodological descriptions in individual sectors, for example, fuel combustion, iron and steel production, and explanations of the selection of methodologies and EFs. Any country-specific data (EFs and parameters) should be identified and referenced, and the basic assumptions on how these data are derived should be documented in the NIR. Documentation on recalculations, qualitative information and assumptions on uncertainties, the areas for improvement identified as well as a description of the QA/QC plan and information on QA/QC procedures already implemented or to be implemented in the future should also be included in the NIR.

34. The ERT found that in table 9(a) only limited information was provided on the use of notation keys. The NIR states that for categories where emissions do not occur or are not estimated the notation key “NE” was used in the CRF tables. However, this corresponds to the notation keys “NE” and not occurring (“NO”), respectively, in accordance with the UNFCCC reporting guidelines. The ERT recommends that Poland use the notation keys in a manner that is consistent with the UNFCCC reporting guidelines and provide clear explanations as to the use of the notation keys in its next NIR. The ERT encourages Poland to include all relevant information in the documentation boxes of the CRF tables or to make reference to the respective chapter in the NIR.

Consistency

35. The ERT concluded that Poland’s inventory is broadly consistent with the UNFCCC reporting guidelines and the IPCC good practice guidance. During the in-country review, Poland provided a qualitative overview of the improvements to inventory methodologies since the 2005 submission, but no overview of the quantitative changes at the level of categories was provided. Poland stated that the recalculations for the base year have been triggered by time-series inconsistencies (previous base year emission calculations were based on different methodologies carried out by a different institution) and transparency problems due to the lack of documentation on methods, EF and AD used. The ERT noted that a complete CRF for the base year was provided for the first time in the 2006 submission and acknowledges the efforts made by Poland to improve time-series consistency. Nevertheless, the ERT noted that the recalculations were not always made in accordance with the IPCC good practice guidance, mainly concerning the consistent use of the data sources used (e.g. agriculture – milk production for dairy cattle). The ERT recommends Poland to ensure that any future recalculations are made

consistently and prepared in accordance with the IPCC good practice guidance, and to include information on this in its future NIRs.

Comparability

36. Poland's GHG inventory is comparable with those of other Annex I Parties, as defined in the UNFCCC reporting guidelines. It follows the methodological and reporting formats for estimating and reporting inventories agreed by the CMP. The allocation of the categories follows the split in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

37. The ERT appreciated that Poland has made significant progress in increasing the comparability of its inventory with those of other Annex I Parties by submitting for the first time an entire time series of CRF tables covering the period 1988–2004, and by recalculating the whole inventory for the years 1988–2003, thus providing for the first time a consistent time series with regard to methodologies and EFs.

Accuracy

38. The Polish inventory is generally accurate, as defined in the UNFCCC reporting guidelines and the IPCC good practice guidance. However, during the in-country review the ERT identified a few categories where the methods, AD or EFs used were not fully in accordance with the IPCC good practice guidance and might lead to an overestimation of emissions in the base year or an underestimation of emissions in the most recent years (see paragraph 28). During the in-country review, the ERT recommended Poland to revise its estimates for these categories. After the in-country review, Poland provided revised estimates for these categories for the entire time series, and in particular for the base year and 2004, in accordance with the recommendations of the ERT. Further details are provided in the sectoral sections below.

Recalculations

39. 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.

40. The ERT noted that recalculations reported by Poland in its 2006 submission of the time series from 1988 to 2003 had been undertaken to take into account the recommendations of the 2005 in-country review. The recalculations covered all sectors and led to an increase in the national total of between 2.1 and 8.4 percent over the 1988–2003 period. The recalculation of the 1988 emissions between the 2005 and 2006 submissions resulted in an increase of the estimate of total GHG emissions of 4.0 per cent. In its 2006 inventory submission, Poland has provided an entire time series for the CRF tables (1988–2004) for the first time; earlier submissions contained only CRF tables for the latest reporting year. No inventory recalculations were provided in earlier submissions; information on recalculations is thus fairly limited. The ERT acknowledges that during the in-country visit Poland provided a qualitative overview of the improvements leading to recalculations of the inventory, but a sector-by-sector comparison of emission data for 1988 between the 2005 submission and the 2006 submission was not provided.

41. The ERT expects that in the future Poland will ensure that any recalculations are prepared in accordance with the IPCC good practice guidance and relevant CMP decisions and that Poland will report recalculations in a transparent manner in the CRF tables. The ERT emphasizes the need to establish a transparent and well documented process with regard to recalculations, and to report the recalculations comprehensively in the NIR.

Uncertainties

42. Poland has provided a tier 1 uncertainty analysis for each category and for the inventory in total, following the IPCC good practice guidance. However, the analysis is based to a great extent on the default uncertainties included in the IPCC good practice guidance. The information on uncertainties provided in the NIR is not yet fully consistent with the requirements of the UNFCCC reporting guidelines since it does not include any qualitative discussion on the uncertainty of the data used for all categories, and in particular for key categories. The ERT encourages Poland to include documentation on uncertainties, including the assumptions and references to these assumptions, in the respective chapters of its next NIR. The ERT also encourages Poland to use more country-specific information and to request the institutions providing AD to estimate the relevant uncertainty data as well.

43. Poland revised its assumptions on uncertainty data between the 2005 and the 2006 submission following the recommendation of the review of the 2005 submission. This revision and the inclusion of uncertainty data on HFCs, PFCs and SF_6 emissions for the first time produced a much higher overall level of uncertainty in the inventory. Thus, the overall improvement in the inventory is not reflected in a reduction of overall uncertainty.

3. Areas for further improvement identified by Poland

44. The NIR does not identify any areas for improvement. After the in-country review, in its response to the issues raised during the review, Poland indicated that it is working to improve its estimates in the LULUCF sector using the methodologies of the IPCC good practice guidance for LULUCF, as well as planning improvements to the transparency of the NIR and revisions to methods for a number of categories in other sectors (e.g. iron and steel, and industrial wastewater).

4. Areas for further improvement identified by the ERT

45. The ERT identifies the following cross-cutting issues for improvement. The ERT recommends that Poland:

(a) Adopt the draft Act on instruments supporting the reduction of GHG emissions and other substances that will strengthen the clear and independent legal basis for the national system and report on its adoption in its next submissions under the Kyoto Protocol;

(b) Provide more precise descriptions and documentation on the legal, institutional and procedural arrangements of its national system, including plans for strengthen its institutional capacity, in its next submission under the Kyoto Protocol;

(c) Implement the QA/QC plan and include information on the QA/QC plan, including QA/QC procedures for activities related to Article 3, paragraphs 3 and 4, of the Kyoto Protocol in the future NIRs;

(d) Continue to develop the archiving system, ensuring that has sufficient capacity to organize and maintain all the necessary electronic information of inventory submissions and the supporting information required to produce the national emission inventory estimates;

(e) Submit a single NIR covering the entire time series and following the structure outlined in the UNFCCC reporting guidelines, including more comprehensive and precise descriptions and documentation of methodologies and EFs that differ from those of the IPCC, and providing better explanations of the emissions trends;

(f) Improve transparency of reporting by further elaboration of the NIR and inclusion of the relevant sections on trends, recalculations, future improvements and category-specific information on QA/QC, uncertainty and time-series consistency;

(g) Include reporting of recalculations, their rationale, and explanation of methodological changes, ensuring that any future recalculations are consistently made, presented for all the years of the inventory, prepared in accordance with the IPCC good practice guidance and fully documented in its future NIRs;

(h) Improve AD consistency and methods applied for a number of categories to bring them in line with the requirements of the IPCC good practice guidance and the UNFCCC reporting guidelines;

(i) Collect country-specific AD and develop well-documented country-specific EFs for use with higher tier methods for key categories;

(j) Use more country-specific information in calculations of uncertainties and include the qualitative discussions on uncertainty of the data used for all categories, and in particular for key categories, in its next NIR;

(k) Improve the completeness of CRF tables by including tables 8(a) and 8(b) (recalculations), tables 9(a) and 9(b) (completeness) as well as systematic use of notation keys and better use of documentation boxes;

(l) Provide estimates for the LULUCF sector according to the IPCC good practice guidance for LULUCF.

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

5. Energy

Sector overview

47. In the Kyoto Protocol base year (1988 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6), the energy sector in Poland accounted for 83.5 per cent of total national GHG emissions. Fuel combustion contributed 79.4 per cent to the total national emissions and 95.2 per cent to total GHG emissions from the sector. Total GHG emissions from the energy sector have decreased by 31.5 per cent from the base year to 2004. In the base year the most important categories in the sector are energy industries (1.A.1) and other sectors (1.A.4), contributing 57.3 and 24.0 per cent to the energy emissions, respectively. Fugitive emissions contributed 4.8 per cent of the total energy emissions. The percentage changes between the base year and 2004 for each gas from the energy sector are: CO_2 (–31.4 per cent), CH_4 (–36.4 per cent) and N_2O (+4.0 per cent).

48. Poland indicates in the NIR that the most important decrease in emissions occurred in the period 1988–1990, largely a consequence of the decline in industrial activities. The remaining reduction is mostly ascribable to fuel use switching and, to a lesser degree, to an increase in energy efficiency in the industrial sector.

49. The methodologies applied in the calculations are mainly IPCC tier 2 for fuel combustion with CO_2 country-specific EFs and tier 1 methods for fugitive emissions.

50. The NIR and the CRF tables provided for the energy sector inventory estimates generally complete. The estimates are complete in terms of geographical coverage for all gases and for the entire time series. However, emissions from fuel combustion in some minor categories are missing: CO_2 emissions from mining and post-mining activities (underground and surface mines); CH_4 emissions from

surface mines – post-mining activities; CH_4 and CO_2 emissions from oil refining/storage, distribution of oil products, other (oil), exploration (oil and natural gas), venting and flaring (oil, gas and combined), and from other leakage (natural gas) at industrial plants and power stations and residential and commercial sectors. After the in-country review, Poland made significant efforts to provide the majority of the missing estimates, including CH_4 emissions from oil – refining/storage and CO_2 and CH_4 from other leakage (natural gas) and to revise estimates of a number of categories, described in detail below in this section and informed the ERT that emissions from aviation gasoline from civil aviation reported originally as not estimated ("NE") were included under other– mobile (1.A.5b). The total revisions resulted in a decrease of the GHG emissions of the sector by 5.6 per cent or 27,655.62 Gg CO_2 eq. in the base year (from 497,964.68 Gg CO_2 eq. to 470,309.06 Gg CO_2 eq.) and 1.4 per cent or 4,666.68 Gg CO_2 eq. in 2004 (from 326,913.31 Gg CO_2 eq. to 322,246.64 Gg CO_2 eq.).

51. Besides the general problem of inventory transparency linked to the submission of an NIR for each inventory year, another issue of transparency is linked to the improper use of notation keys. Thus for example, emissions from other fuels in all categories of fuel combustion (from 1.A.1 to 1.A.5) are reported as "NE" and not applicable ("NA") while the proper notation key should be "NO".

52. Time-series consistency is very difficult to assess since Poland submitted one NIR per inventory year. However during the in-country review the ERT managed to compile a relevant time series for the energy sector and found some isolated cases of inconsistency, such as GHG emissions from energy use of non-energy products in the residential category (some GHG emission estimates between 1988 and 1996 were reported). During the review process, Poland recognized the inconsistency and decided to remove emissions from non-energy products from the total estimates.

53. An uncertainty analysis was performed using the IPCC tier 1 method. The estimated uncertainties for the energy sector in the base year are 2.4 per cent for CO_2, 16.1 per cent for CH_4 and 2.8 per cent for N_2O. As is noted in the previous review report, the calculated uncertainty values, particularly those for N_2O and CO_2, appear to be rather low.

54. Poland indicates in the NIR that AD uncertainty depends on the consumption level (the higher the consumption, the lower the associated uncertainty) and that EF uncertainties are based on expert judgment and also on an analysis made by the inventory team of the GHG inventories of other countries. Concerning AD uncertainty, the ERT reiterates the recommendations from the previous review report that Poland include in its future NIRs a discussion of the quality of fuel consumption data and the uncertainty values adopted. For EF uncertainties, the ERT recommends that Poland re-examine the values adopted to perform the analysis and compare these values with other available information for different countries, and include in the NIR the rationale for adopting the values, including the procedures used for eliciting expert judgment.

55. The ERT welcomed the efforts made by Poland to improve reporting in the energy sector, providing a consistent time series for the first time and including emission estimates in some categories where emissions previously were not estimated. Poland has made significant efforts to develop country-specific methods and EFs, but this information has not been included in the NIR. This is unfortunate because it impairs transparency and denies other Parties access to these data.

56. The ERT also encourages the inventory team to play the key role in reviewing, critically assessing, reporting and documenting the information required for compiling the inventory and also in trying to reconcile the data provided by different information sources and further strengthening the data QA/QC procedures for the energy sector.

Reference and sectoral approaches

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

57. Both reference approach and sectoral approach calculations for CO_2 emissions from fuel combustion are given for the base year. There is no discussion of the differences between or comparison of the reference approach with sectoral approach estimates in the NIR. Apparent consumption in Poland's reference approach for the base year was not possible to compare to the International Energy Agency (IEA) data, as these last were not available during the review.

58. During the in-country review, Poland informed the ERT that the reference approach is not prepared by the inventory team but by an independent expert in cooperation with the Energy Market Agency (ARE). Therefore, no substantial additional background information on the differences was available to the ERT. The ERT recognized that some differences may arise from how non-energy use of fuels is handled, both in the reference approach and in the sectoral approach. The ERT also recognized that the conversion factor (23.11 TJ/Gg) used in the reference approach for other bituminous coal differs from that used in the sectoral approach (20.93 TJ/Gg). Therefore, the ERT recommends Poland to establish the necessary institutional arrangements to clearly set out the overall responsibility for preparing the emissions estimates for the energy sector, which will facilitate timely preparation of the reference approach and provide full discussion of and justification for the possible differences between the two approaches in the NIR. After the in-country review, Poland provided revised estimates both for reference approach and sectoral approach calculations for CO_2 emissions. The sectoral approach CO_2 emission estimates were 0.6 per cent lower than those of the reference approach. However, the comparison of the fuel consumption by fuel types shows discrepancies of 35.0 per cent for gaseous fuels, 24.0 per cent for liquid fuels and 7.1 per cent for solid fuels.

59. As is noted in the previous in-country review, Poland has added two extra rows to the CRF table 1.A(b) to deal with the two types of natural gas (high-methane and nitrified). Although these two types of fuel are dealt with in a transparent manner, for comparability purposes it is recommended that Poland provide the information on natural gas in an aggregated form without modifying the CRF table, leaving the disaggregated treatment of gaseous fuels for the NIR.

60. The ERT also noted that liquefied petroleum gas (LPG), jet kerosene, other kerosene (aviation gasoline) and some refinery products (petrocoke, naptha, bitumen and lubricants) are not reported in the reference approach while peat is only reported under apparent consumption (not production). The ERT encourages Poland to continue the process of improvements and corrections to the reference approach in its next submissions and also to include either emissions estimates for the abovementioned fuels or the relevant notation keys.

International bunker fuels

61. No information is provided in either the NIR or the documentation box of CRF table 1.C about the methodology for allocating fuel consumption between domestic and international transportation. Marine bunkers data are based on IEA and Eurostat energy statistics for Poland. During the in-country review, Poland provided additional information and revised estimates for navigation (see paragraph 86). The revisions resulted in a change in the split between fuel consumption for domestic use and international marine transport in the base year from 58.0 and 42.0 per cent to 8.0 and 92.0 per cent, respectively. The respective change for 2004 is from 19.5 and 80.5 per cent to 1.1 and 98.9 per cent, respectively. Polish statistics also include fuel purchased abroad by the Polish fleet. This fuel was correctly excluded from emissions estimates.

Feedstocks and non-energy use of fuels

62. AD on feedstocks and non-energy use of fuels are available from the Central Statistical Office (GUS) and the ARE. In the Polish energy statistics, the so-called non-energy products include bitumen, kerosene, lubricants, motor oil, naphtha, paraffin, raw benzole, solvents, tar, tar residues, vaseline, wax and other oil products. A fraction of these products is combusted for energy purposes in different energy transformation and industrial activities. Poland reported some fuels, such as natural gas, gas/diesel oil, ethane, butane, LPG and asphalt, as "NE" in table 1.A(d). The ERT encourages Poland to make the necessary efforts to report the amount of these fuels used as feedstock or used for other non-energy purposes in this CRF table or to use the appropriate notation key.

63. Poland is estimating combustion GHG emissions from non-energy products (identified in appendix 2 of Gospodarka Paliwowo-Energetyczna w latach 2003, 2004 (Energy Balance 2003, 2004)) under commercial/institutional category (1.A.4a) for the years 1988–2004. For 1996 onwards, emissions from these products are reported as "0". During the in-country review, the ERT recommended Poland to provide all the relevant supporting background documentation and the rationale for this inclusion of emissions from non-energy products used for non-energy activities under the commercial/institutional category for the period 1988–1995 or to exclude GHG emissions from those fuels. After the in-country review, in its response to the ERT, Poland revised its emission estimates and removed the emissions from non-energy products from the emission estimates for all categories under stationary combustion (1.A.1, 1.A.2, 1.A.4 and 1.A.5a).

64. The overall impact of the revisions to exclude non-energy products from stationary combustion was a decrease of the CO_2, CH_4 and N_2O emissions by 1.7 per cent in the base year (from 445,433.26 Gg of CO_2 eq. to 437,750.76 Gg of CO_2 eq. or 7,682.50 Gg of CO_2 eq.).

Key categories

Stationary combustion: solid fuels – CO_2

65. Stationary combustion of fossil fuels is dominated by domestic other bituminous coal (brown coal) and lignite consumption in thermal power plants (1.A.1a public electricity and heat production). The CO_2 EFs for coke, lignites, hard coal, fuel oil, coke oven gas, town gas, blast furnace gas and high methane natural gas used in fuel combustion were estimated using a country-specific equation[4] which correlates the net calorific values (NCVs) of the fuel with its carbon content. Following the recommendation of the 2005 review report, Poland revised the equation for lignite and hard coal based on analysis of lignite and hard coal samples taken in 2005 and 2006.[5]

66. The ERT recommended Poland to provide the necessary and substantive supporting documentation for the analyses used for deriving the equations for estimation of carbon content in fuels for the entire time series 1988–2004 including the range of applicability of each correlation in terms of the NCV of the corresponding fuel and the corresponding confidence limits as recommended in the 2005 review report (FCCC/ARR/2005/POL).

67. In response to the recommendations, after the in-country review Poland applied IPCC default EFs for the following fuels: coke, gasoline, fuel oil, coke oven gas, town gas, blast furnace gas and high methane natural gas taken from recently published recognized international literature.

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[4] Referenced in Opracowanie krajowego zbioru paliw kopalnych I ich pochodnych wg klasifykaciji OECD (IEA), Zasanie2, FEWE, Katowitze 1994.

[5] Opracowanie I analiza danych dotyczacych zawartosci wegla pierwiaskowego w paliwach stalych, Gliwice, 31.05.2006.

68. During the in-country review, the ERT noted that the range for the lignite NCV from the analysed samples varies from 7.72 MJ/kg to 12.45 MJ/kg. However, 97 per cent of lignite used in energy industries has an NCV in the range of 8.01–8.74 MJ/kg for the time series 1988–2004. The range of NCVs of the analysed lignite samples is significantly larger than the range of NCVs for the majority of fuel consumed in energy industries and the dataset appears to be biased towards the higher NCV values. Information on the range of applicability of correlation in terms of the NCV and the corresponding confidence limits was not available during in-country review.

69. In the absence of the necessary substantive supporting documentation for the analyses of the representativeness of the 2005–2006 samples used to derive the equation for lignite for the time series 1988–2004 in Polish national conditions, the ERT was not able to draw conclusions during the in-country review on the appropriateness of the methodology used to estimate CO_2 EFs for lignite.

70. The ERT recommended Poland to provide detailed information with regard to lignite samples dating from 2005–2006; background materials to demonstrate the representativeness of the analysed samples for the entire time series and predominant sectors; the distribution of NCV of lignite produced in Poland around the mean value; and the rationale behind the decision to derive relevant country-specific functions from samples with NCVs of between 7.72–12.45 MJ/kg.

71. After the in-country review, following the recommendation of the ERT, Poland decided to revise and improve the procedure for obtaining carbon EFs for the combustion of lignite by deriving a new empirical relationship linking carbon content in raw samples with corresponding NCV. The revised formula reflects concerns raised by the ERT about the representativeness of selected samples since it is derived from a much bigger set of relevant lignite samples. The revised NCV were in the range of 8.0–8.5 MJ/kg and the carbon content factors were recalculated at 30.0–31.0 t C/TJ. The ERT was provided with the background information requested to support the new estimates.

72. During the in-country review, the ERT also noted that the range of carbon content factors for brown coal derived from correlation equation based on brown coal samples taken in 2005–2006 varies between 26.2 t C/TJ and 26.5 t C/TJ (in 1.A.1 energy industries and in 1.A.5a other – stationary). All these values are equal to or just above the IPCC default value of 26.2 t C/TJ for sub-bituminous coal and in the range of CO_2 EF for energy industries (92.8 t CO_2/TJ (25.3 tC/TJ) – 100 t CO_2/TJ (27.3 tC/TJ)) provided in recently published recognized international literature. Nevertheless the ERT strongly encourages Poland to further improve the process of determination of national EF for sub-bituminous coal and fully utilize the results of new domestic legislation.

73. Furthermore, during the in-country review the ERT noted that the oxidation factors used to estimate CO_2 emissions from solid fuels in energy industries (0.984) differed from the IPCC default oxidation factor (0.98), and that justification and background documentation was not available. Poland was requested to provide justification and adequate background information on the country-specific oxidation factor or to use the IPCC default oxidation factor for solid fuels (0.98). After the in-country review, in absence of adequate background information, Poland decided to follow the ERT's recommendation and revised its estimates using the default IPCC oxidation factor for solid fuels (0.98).

74. The overall impact of these revisions was a decrease in the CO_2 emissions from solid fuels from stationary combustion of 0.6 per cent in the base year from 400,745.92 Gg to 398,431.89 Gg. The impact for 2004 was a decrease in the emissions of 0.8 per cent from 219,148.28 Gg to 217,313.67 Gg.

75. During the in-country review, the ERT analysed Poland's calculation sheets for the use of coke oven gas and recognized that total energy use of coke oven gas for the base year was 3,421 TJ higher than data documented in Polish energy statistics (Gospodarka Paliwowo-Energetyczna w latach 1988–1989 (Energy Balance 1988-1989)). Non-energy use of coke oven gas contained in the energy statistics under final consumption is not reflected in the CRF tables. The ERT recommended Poland to

revise its emission estimates accordingly. After the in-country review, following the recommendation of the ERT, Poland revised its emission estimates from energy use of coke oven gas.

76. The overall impact of these revisions was a decrease of the CO_2, CH_4 and N_2O emissions from coke oven gas combustion of 3.2 per cent in the base year from 5,601.4 Gg CO_2 eq. to 5,423.1 Gg CO_2 eq. No revision of estimates has been done for 2004, since the original estimates were correct.

77. The ERT also encourages Poland to present in its subsequent submissions a full carbon balance of inputs and outputs of fuel used in the iron and steel category (1.A.2a) and to describe the links to the fuel reported under the industrial processes sector in order to increase transparency and avoid possible underestimation or overestimation of related emissions.

78. The overall impact of all the revisions indicated above was a decrease in the GHG emissions from solid fuels from stationary combustion of 3.1 per cent in the base year from 402,656.42 Gg CO_2 eq. to 390,327.56 Gg CO_2 eq. The impact for 2004 was a decrease in the emissions of 0.8 per cent from 223,358.16 Gg CO_2 eq. to 221,639.62 Gg CO_2 eq.

Stationary combustion: liquid fuels – CO_2

79. During the in-country review, the ERT noted a discrepancy between Poland's calculation sheets for the base year and data presented in the Polish energy statistics (Energy Balance 1988-1989). The total energy use of liquefied petroleum gas (LPG) in the calculation sheets is 3,350 TJ higher than in Polish statistics. The ERT noted that non-energy use of LPG contained in energy statistics under final consumption is not reflected in the corresponding CRF tables. The ERT therefore recommended Poland to provide an explanation for the discrepancy and, if appropriate, correct the estimates for LPG combusted and revise the related CO_2, CH_4 and N_2O emissions. After the in-country review, following the recommendation of the ERT, Poland explained that the discrepancy was because the non-energy use of the LPG was not separately reported in the balance and was not subtracted in the CRF tables.

80. The impact of all the revisions made in this category, including removal of non-energy products (see paragraph 64), revision of EFs (see paragraph 67) and appropriate allocation of non-energy use of LPG, was a decrease by 30.5 per cent in the emissions of GHG from liquid fuels from stationary combustion for the base year, from 27,133.85 Gg CO_2 eq. to 18,864.68 Gg CO_2 eq. The impact of the revisions for 2004 was a decrease of the emissions by 13.0 per cent from 32,574.60 Gg CO_2 eq. to 28,336.02 Gg CO_2 eq.

Stationary combustion: gaseous fuels – CO_2

81. The calculation sheets provided to the ERT by Poland during the in-country review showed that total energy use of high methane natural gas for the base year was 471 TJ higher than data presented in the Polish energy statistics (Energy Balance 1988-1989). The ERT requested Poland to explain the reasons for the difference and to correct, if appropriate, the estimates for high methane natural gas consumption and related CO_2, CH_4 and N_2O emissions. Poland explained that the difference resulted from it taking the amount of high methane natural gas use in the agriculture/forestry/fisheries category (1.A.4c) from the OECD balance (532 TJ) and not from the Energy Balance 1988-1989 (60 TJ). This was because the agriculture sector in the Energy Balance 1988-1989 only includes collective agriculture and does not include agricultural cooperatives. Following the recommendation of the ERT, the same data source (Energy Balance 1988-1989) was applied consistently for the entire time series.

82. As is mentioned above (see paragraph 65), natural gas CO_2 EFs were estimated using a country-specific equation,[6] which correlates the NCVs of the fuel with its carbon content but after the

[6] Referenced in Opracowanie krajowego zbioru paliw kopalnych I ich pochodnych wg klasifykaciji OECD (IEA), Zasanie2, FEWE, Katowitze 1994.

in-country review these were changed to the IPCC default values. The result of the above-mentioned revisions for the category was a 1.7 per cent increase in the GHG emissions for the base year, from 15,576.93 Gg CO_2 eq. to 15,838.05 Gg CO_2 eq. The impact for 2004 was an increase in the CO_2 emissions of 3.9 per cent, from 20,374.96 Gg CO_2 eq. to 21,161.83 Gg CO_2 eq.

Road transportation – CO_2 and N_2O

83. A country-specific model is used for estimating CO_2 emissions from road transportation. The NIR does not include a discussion of the key assumptions and the input data used to run the model. During the in-country review, Poland provided the ERT with information about the model and the background references (ITS, 2004). The model uses distance-based AD to estimate the disaggregated fuel consumption of vehicles organized in the following subcategories: passenger cars, light-duty vehicles, heavy-duty vehicles, buses, motorcycles and tractors. In the relevant subcategories, vehicles are further disaggregated according to the presence (or absence) of catalytic converters. However, the NIR does not contain enough information on the methodology applied. To improve the transparency of the methodology used for calculations, the ERT strongly encourages Poland to follow the recommendations of the previous review report (2005) and provide in its future submissions information on the main characteristics of the model, including at least a summary of the relevant AD and decisions/expert judgments made about the key features, such as fuel use balance.

84. The same model is also used to estimate CH_4 and N_2O emissions. In this case, the EFs applied are not derived from country-specific measurements but based on CORINAIR and the Revised 1996 IPCC Guidelines. To improve transparency, the ERT recommends that Poland provide in its future submissions information on the rationale for the selection of EFs, and a summary of the EFs used and the manner in which catalyst deterioration is accounted for by the model. It also recommends that Poland specify appropriately in the CRF, summary table 3, the use of EFs adopted from the guidelines indicated above.

85. Given the increasing trend in N_2O emissions from road transportation, which are a key category in trend assessment, the ERT recommends that Poland follow the development of these emissions closely.

Navigation – CO_2

86. Navigation appears as a key category in the secretariat's trend analysis. Poland reports a relatively high proportion of fuel used in navigation (1.A.3d) (57.97 per cent) in the base year (30,135.54 TJ, compared to fuel accounted for in marine bunkers, 21,846.30 TJ). No supporting information or evidence is provided in the NIR on levels of international versus domestic shipping activity. Discussions during the in-country review indicated that the allocation of consumption was based on the nationality of the ship. The ERT and Poland came to the conclusion that the ship's flag was not an appropriate driver for dissagregation of fuel used in navigation and international marine bunkers, and is not in accordance with the recommendations of the IPCC good practice guidance. After the in-country review, Poland provided additional information and revised estimates based on GUS data in the Questionnaire/Report G-03, selected data from the energy statistics system (GUS, 1990) and statistical data on levels of international and domestic shipping activity.[7] As these levels fluctuate throughout the time series an average level of domestic shipping activity of 2 per cent was assumed for 1988–1996 and 1 per cent for 1997–2005. The overall impact of the revisions was a decrease of the GHG emissions by 93.6 per cent in the base year from 2,365.52 Gg CO_2 eq. to 152.57 Gg CO_2 eq. The impact for 2004 was a decrease of the emissions by 95.2 per cent from 196.97 Gg CO_2 eq. to 9.43 Gg CO_2 eq. The ERT appreciates the additional efforts made by Poland to revise GHG estimates and

[7] Cargo traffic in Polish seaports by handling directions published in: Tendencies in Polish maritime economy in the 1990's. Statistical Office in Szczecin. Warszawa, Szczecin, 2001.

encourages Poland to make further efforts to improve its estimates using detailed fuel statistics in its subsequent submissions and to provide additional background information in the NIR in order to increase transparency.

Other – CO_2

87. Poland initially allocated in other – mobile (1.A.5b) motor fuels used by industry and construction, including municipal economies, and aviation fuel used in agriculture. The ERT recommended Poland to allocate liquid fuels under the appropriate sectors. Poland followed this recommendation and reallocated all fuels previously allocated to 1.A.5 to the appropriate categories (1.A.2, 1.A.3 and 1.A.4).

Coal mining and handling – CH_4

88. The amount of other bituminous coal and coking coal produced in the period 1998–2004 was selected as the AD to estimate CH_4 emissions from underground coal mining and handling, while emissions from surface mines were estimated on the basis of the production of lignite. Comparison between the data indicates different values for lignite and bituminous coal production in CRF table 1.B.1 (fugitive emissions) and table 1.A(b) (reference approach). While in the reference approach 193.02 Mt is reported for bituminous coal production in the base year, the value in the table for fugitive emissions is 191.60 Mt. The two reported values for reported lignite production are 73.49 Mt and 73.97 Mt, respectively. The ERT strongly encourages Poland to provide in its future submissions an explanation for the differences between the amount of solid fuel reported in CRF table 1.B.1 and solid fuel production reported in table 1.A(b), or to eliminate the discrepancy as appropriate.

89. During the in-country review, Poland informed the ERT that, emission estimates for underground mining include degasification and ventilation systems, post-mining activities, process waste dumps and abandoned mines; while estimates for surface mines only take into account ventilation systems from the coal seam and the surrounding rocks. EFs for ventilation emissions are adopted for the period 1988–1997 from Gawlik et al. (1994), for the period 1998–2000 from Gawlik and Grzybek (2001) and for the period 2001–2004 from Kwarciński (2005), where CH_4 emissions from 42 Polish underground mines were compiled in order to estimate the corresponding CH_4 EFs. The same study also contains EFs for CH_4 for mining and post-mining activities.

90. EFs for surface mines were adopted from the study *Establishment of GHG sources related to handling of coal (hard and brown coal) system and estimation of emission factors in emission system sources* (Gawlik et al., 1994). The country-specific EFs for surface mines (0.01273 kg/t) are one order of magnitude lower than both the IPCC default EFs (0.20–1.34 kg/t) and the implied emission factors (IEFs) of reporting Annex I Parties (except Germany). The ERT recommends that Poland re-examine the adoption of these EFs and, if it considers them satisfactory, provide a description of their derivation and make efforts to provide access to this information in its next NIR.

91. To improve current time series consistency, especially for CH_4 emissions from ventilation systems, the ERT encourages Poland to analyse differences in EFs from the different national studies and if appropriate consider using interpolation for emission estimates for the years where Poland assumed a constant EF, starting from the year in which the study was conducted. To improve transparency, it is recommended that Poland provide in its future submissions a full description of the method used to estimate these emissions, as well as the supporting information.

92. To improve completeness for this category, the ERT encourages Poland to estimate CH_4 emissions from surface post-mining activities, CO_2 emissions from all 1.B.1.a Coal Mining and Handling activities, and emissions form solid fuel transformation currently reported as "NE".

Oil and natural gas – CH_4

93. Poland reports emissions from production and transport of oil and production, transmission and distribution of natural gas. All other sources are reported as "NE". The ERT also encourages Poland to estimate CH_4 and CO_2 emissions from categories where emissions are currently not estimated, such as other leakages from industrial plants and power stations and in residential and commercial sectors. After the in-country review, Poland included estimates for refining/storage of oil and from other leakages. The impact of these inclusions was an increase in the emissions of CH_4 of 1.42 Gg (29.84 Gg CO_2 eq. taking into account small amount of CO_2 emissions from other leakages) in the base year and 1.79 Gg (37.61 Gg CO_2 eq. taking into account small amount of CO_2 emissions from other leakages) in 2004.

94. Emissions are estimated using a tier 1 method and country-specific EFs (Radwański, 1995). To improve transparency, the ERT recommends that Poland provide the whole set of country-specific EFs and the main features of the way in which they are derived in its next NIR. Fugitive emissions of CH_4 for natural gas – production/processing (1.B.2.b.ii) are calculated on the basis of total (high methane) natural gas consumption, which includes imported natural gas, while the (high methane) natural gas produced in Poland is limited to only 71.374 PJ. It is common practice for imported gas to be processed prior to transportation and export. Therefore, the ERT during the in-country review recommended that only emissions from gas produced in Poland should be included in production/processing estimates. Poland followed the recommendation of the ERT and, after the in-country review, provided revised emission estimates using only the national production of natural gas as AD. Overall emissions from this category are relatively low so the impact on the emissions was a reduction of only 4.0 Gg of CO_2 (52.0 per cent) in the base year and 5.3 Gg of CO_2 (58.6 per cent) in 2004.

95. All the revisions discussed in the paragraphs above for this category resulted in a minor increase of the GHG emissions by 0.2 per cent in the base year from 4,169.85 Gg CO_2 eq. to 4,177.23 Gg CO_2 eq. and by 0.2 per cent in 2004 from 5,303.64 Gg CO_2 eq. to 5,312.45 Gg CO_2 eq.

96. Emissions from transmission and distribution systems are estimated using the amount of natural gas consumed as AD. The ERT recommends Poland to revise its country-specific EFs to correspond to the AD on the basis of the length of pipelines. The ERT appreciates that Poland followed the recommendation from previous review report and reallocated fugitive emissions from coke gas systems from 1.B.2.c venting to 1.B.1c other (under fugitive emissions from solid fuels) and significantly improved comparability and transparency.

Non-key categories

Civil aviation, railways and other transportation – CO_2, CH_4 and N_2O

97. The NIR does not provide information on the methods, AD and EFs used to estimate emissions in these categories. During the in-country review, Poland explained that tier 1 methods have been used to estimate these emissions. To improve transparency and consistency, it is recommended that Poland include a brief discussion of this information in its future submissions and that it also report appropriately in the CRF summary table 3 the use of tier 1 methods and non-country specific EFs.

98. After the in-country review, when Poland provided revised estimates following the ERt recommendations, these categories were also affected due to changes in EFs and AD applied consistently to the inventory estimates. As a result, in the base year GHG emissions from civil aviation increased by 248.7 per cent from 35.21 Gg CO_2 eq. to 122.77 Gg CO_2 eq., while GHG emissions from railways increased by 7.7 per cent from 3,596.71 Gg CO_2 eq. to 3,874.31 Gg CO_2 eq. For 2004, GHG emissions for civil aviation increased by 106.5 per cent from 21.11 Gg CO_2 eq. to 43.58 Gg CO_2 eq., while the GHG emissions from railways decreased by 8.6 per cent, from 573.72 Gg CO_2 eq. to 524.33 Gg CO_2 eq.

6. Industrial processes and solvent and other product use

Sector overview

99. The industrial processes sector contributed 5.8 per cent of Poland's total GHG emissions in the Kyoto Protocol base year (1988 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6), while the solvents and other product use sector are estimated to have contributed 0.2 per cent. The main categories in the sector are iron and steel, contributing 33.3 per cent of total emissions from the sector; cement production, 21.4 per cent, ammonia production, 14.0 per cent, and lime production, 10.6 per cent. The inventory covers the main sources of GHG emissions in the sector, but some minor categories are reported as "NE", including CO_2 emissions from limestone and dolomite use, asphalt roofing, road paving with asphalt, food and drink and glass production; CH_4 from dichloroethylene, methanol, styrene, and ferroalloys production; CO_2, CH_4 and N_2O from non-ferrous metals, and SF_6 used in aluminium and magnesium foundries. For limestone and dolomite use the notation key "NE" was used instead of "IE". After the in-country review, Poland amended its CRF tables, resolving some of the above mentioned issues, in response to the ERT's comments. Potential emissions for fluorinated gases (F-gases) are only reported for some years and there are no estimates for the base year. The ERT recommends Poland to verify the use of notation keys in its inventory and to further improve the completeness of the estimates in its next GHG inventory submission.

100. In general, Poland has estimated emissions according the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. A number of improvements were recommended by the ERT during the in-country review, as explained in detail in the paragraphs below, and many of these were implemented by Poland during the review process (e.g. ammonia production – CO_2 (2.B.1), steel production – CO_2 (2.C.1)). To improve transparency, Poland's NIR requires improvements to a number of sectoral methodological descriptions and provision of a description of trends for the six GHG emitted by the sector. The ERT encourages Poland to implement improvements to the remaining categories and to include the detailed descriptions provided to the ERT and a full description of trends in its future NIRs.

101. The QA/QC activities implemented by Poland were described to the ERT during the in-country review and are considered appropriate for the industrial processes sector. However, the activities are poorly documented in the NIR and in the calculations spreadsheets presented to the ERT. The ERT encourages Poland to improve the description of QA/QC activities for the industrial process sectors in future NIRs.

102. Poland has addressed a number of the issues raised in the 2005 review report. However, in a number of other cases Poland has not implemented the recommendations, for example, to provide the calcium oxide (CaO) content of limestone, the primary references for the cement sector and descriptions of country-specific AD for nitric acid production in its next NIR.

103. In the 2006 inventory submission, recalculations compared to the 2005 inventory have been reported only for the years 2000–2003 and show significant changes to the 2003 emissions for the industrial processes sector as a whole, and in particular for CO_2 emissions from the cement, metal and chemical industries – contributing to overall national changes of + 0.80, –0.51, + 1.04 and +0.28 per cent respectively.

104. Uncertainties in the sector have been estimated to be 6.0, 15.4 and 26.4 per cent for CO_2, CH_4 and N_2O emissions, respectively. There is no documentation in the NIR of improvements undertaken or planned for the sector. The ERT recommend that Poland provide complete recalculations of the CRFs (ensuring that these are recalculations compared to the previous submission), descriptions of the recalculations, and clear explanations of the improvements, including the rationale for the improvements, in future NIRs.

105. After the in-country review, Poland submitted revised estimates for a number of categories (ammonia production, iron and steel, and SF_6 from non ferrous alloys) and additional estimates from ferroalloys production and zinc and lead production. These revisions have resulted in a 20.0 per cent increase for the base year for the industrial process sector from 27,356.20 Gg CO_2 eq. to 32,832.19 Gg CO_2 eq. The impact for 2004 was an increase in the emissions by 3.8 per cent from 22,843.21 Gg CO_2 eq. to 23,715.58 Gg CO_2 eq.

Solvents and other products use – CO_2

106. Poland estimates emissions from solvent use using its non-methane volatile organic compounds (NMVOC) inventory and a fixed assumed ratio of CO_2 to NMVOC of 85 per cent. As these sources make up only a very small component of Poland's emissions inventory, and because more important improvements to the inventory are required, this approach is considered acceptable by the ERT. Estimates of N_2O emissions from medical use are reported in Poland's inventory but there is very little description of the estimation method in the NIR. The ERT recommends that Poland provide a more detailed description of emissions from N_2O for medical use.

Key categories

Cement production – CO_2

107. Poland used a combination of default EFs and country-specific data for emissions estimates from the cement industry. The IEFs reported in the CRF tables show that a single value was used for the estimates between 1988 and 2000 (0.525 t CO_2/t clinker) and a variable country-specific EF for 2001–2004 (0.527 – 0.531 t CO_2/t clinker). During the in-country review, Poland provided copies of the cement feedstock analyses to illustrate the high CaO content of the limestone used in order to substantiate the country-specific EFs used, and clarified that the constant value of 0.525 t CO_2/t clinker was based on industry estimates using the default factor for tier 1 cement emissions calculated from the guidelines for GHG emissions monitoring and reporting pursuant to Directive 2003/87/EC of the European Community. As there is a significant difference between the default EF used for 1988–2000 and the country-specific EFs used for 2001–2004, during the in-country review the ERT recommended that Poland revise its emissions estimates from cement production using an average for the years 2001–2004 applied to the entire time series 1988–2000 and provide documentation on the emissions, EFs and assumptions used. The ERT also noted a lack of transparency in the NIR for this category. The ERT encourages Poland to revise its estimates for this category in future submissions and to fully document the methods, data sources and assumptions used in the NIR.

Ammonia production – CO_2

108. Poland estimated emissions using an IPCC default EF (1.5 t/t) and national statistics on ammonia production for the entire time series in its 2006 GHG inventory submission estimates. During the review, the ERT recommended that Poland use detailed statistics on the feedstocks in the ammonia process. After the in-country review, in response to the ERT's recommendation, Poland provided revised estimates using national statistics on natural gas and coke oven gas consumption in the ammonia process along with associated industry-specific data on emissions. This increased the emissions from ammonia production for the base year by 22.2 per cent from 3,757.84 Gg CO_2 eq. to 4,593.28 Gg CO_2 eq. The impact for 2004 was an increase in the emissions by 15.1 per cent from 3,861.59 Gg CO_2 eq. to 4,443.23 Gg CO_2 eq. The ERT concluded that this revised method and the associated documentation were in accordance with the IPCC good practice guidance and considered the revised method and estimates appropriate. The ERT encourages Poland to use this method for future estimations and to provide a suitable explanation of the methods, data sources and assumptions in future NIRs, including the assumptions used in calculating CO_2 emissions.

Nitric acid production – N_2O

109. Poland describes its emission estimates as based on a country-specific EF. The approach used is based on a single EF provided in a national study,[8] which is calculated on the basis of the individual data from all Polish installations for nitric acid production, applied for the entire time series. The NIR does not provide sufficient documentation on the methods used to derive the country-specific EF or any information on the abatement levels in the plants. The ERT encourages Poland to revise the methods used to derive the country-specific EF to ensure that it is consistent over the entire time series, and to provide a more detailed description of the methods and AD in its next NIR.

Iron and steel production – CO_2

110. Following the review, a number of revisions have been made to the iron and steel production category. These revisions are in accordance with the IPCC good practice guide and contribute to a 64.5 per cent increase in emissions from iron and steel production in 1988 (from 6,642.55 Gg CO_2 eq. to 10,925.05 Gg CO_2 eq.) and an increase in the emissions for 2004 of 1.1 per cent from 4,192.40 Gg CO_2 eq. to 4,236.61 Gg CO_2 eq. The majority of the increase is due to the addition of emissions from limestone and dolomite use in the open-hearth furnaces and to revisions of the EFs for coke oven emissions.

111. For the steel subcategories Poland has used country-specific EFs derived from a 1994 study. The EFs for steel cast, basic oxygen furnace steel and electric arc furnace steel production are 62 kg CO_2/Mg steel produced, 11.26 kg CO_2/Mg steel produced and 4.3 kg CO_2/Mg steel produced, respectively, and for iron cast is 61 kg CO_2/ Mg iron produced. During the in-country review, the ERT recommended Poland to estimate emissions using the difference in carbon contents of inputs to and outputs of the processes, in order to improve the transparency and accuracy of the inventory for these processes, and to include the use of limestone and dolomite for open-hearth furnaces. Following the in-country review, Poland revised its estimates for steel cast, basic oxygen furnace steel, electric furnace steel production, iron cast and open-hearth steel using the recommended approach. The ERT considers these revisions appropriate and encourages Poland to include the full documentation related to the revisions that was provided to the ERT in its future NIRs.

112. For the sinter subcategory, Poland used a country-specific approach relying on plant-specific data to derive EFs and AD. There is significant variability in the EFs calculated for individual plants based on country-specific data. These variations result from the different fractions of limestone and dolomite used in the feedstock. The methods are not transparently reported as there is limited description of them in the NIR. The ERT encourages Poland to check the time-series consistency of the data from the sinter plants and to provide a more detailed description of methods and assumptions in its next NIR. It also encourages that, where possible, emissions from the use of limestone and dolomite use are reported separately under 2.A.3.

113. After the in-country review, Poland revised its emissions estimates for the coke subcategory as a response to the revisions requested by the ERT for the energy sector. New values for carbon contents are used according to the recommendations of the ERT for the manufacture of solid fuels and other energy industries category (1.A.1.c). The revisions increased the CO_2 emissions from coke production by 83.7 per cent, from 2,244.25 Gg CO_2 eq. to 4,122.51 Gg CO_2 eq. in the base year and by 35.3 per cent in 2004, from 1,628.81 Gg CO_2 eq. to 2,203.69 Gg CO_2 eq. The ERT considers these changes appropriate and encourages Poland to include revised estimates and the necessary documentation in its future GHG inventory submissions.

114. The emissions for pig iron subcategory have been estimated using a carbon budget approach for the blast furnace processes based on pig iron production, coke consumption and industry based

[8] Kozłowski K. Strategy of reduction of N_2O emission in industry processes, 2001.

assumptions on the ratios of iron produced to the other raw material inputs. However, the ratios of the feedstock materials were fixed and based on industry data rather than national statistics. In addition, the small emissions from the carbon content of the feed sinter and industry-based sinter production estimates have been excluded from the estimates. The trend in CO_2 IEFs from pig iron fluctuates between 0.18–0.42 t/t. In response to recommendations from the ERT during the in-country review, Poland provided revised estimates using corrected data supplied by the ARE. Consistent with the 2006 submission, the output of blast furnace gas was taken from the Energy Balance and expressed in energy units, and the pig iron production for the new carbon balance was taken from Questionnaire/Report G-03. The carbon content in the coke and coke oven gas was estimated based on the default carbon content in these fuels given in the Revised 1996 IPCC Guidelines for consistency with corrected category 1.A inventory. The revisions resulted in a substantial reduction in CO_2 emissions from this category for the base year by 38.9 per cent from 2,771.95 Gg to 1,692.53 Gg and a decrease by 61.2 per cent in 2004 (from 1,788.05 Gg to 693.98 Gg). The ERT accepts these revised estimates and recommends Poland to check its detailed energy balances and statistics for future inventory submissions and to provide further explanations of the methods in its future NIRs.

Non-key categories

Limestone and dolomite use – CO_2

115. This category is reported as "NE" in the CRF tables. Evidence for the limestone and dolomite use estimates was provided for the iron and steel calculations. However, the total use of limestone and dolomite could not be reconciled as there are no national statistics on the total level of supply of limestone and dolomite in Poland. Following the ERT's recommendations, after the in-country review, Poland added estimates of limestone and dolomite use in open-hearth furnaces and revised its notation key for this category to "IE". The ERT considers these revisions to be consistent with good practice. However, where emissions from limestone production and use are estimated separately, the ERT encourages Poland to report these under 2.A.3. In addition, Poland should review the use of limestone and dolomite in industries such as non-iron and steel metallurgy, glass manufacture, LULUCF, construction and environmental pollution control and include these in its estimates for future submissions.

Carbide production – CO_2

116. Poland estimates emissions for carbide (CaC_2) production based on national production statistics and an IPCC default EF (1.1 kg/kg). However, this default EF only includes carbide use. This EF has been applied to carbide production statistics and the factor of 1.8 t CO_2/t CaC_2 produced is not included. The ERT encourages Poland for its next inventory submission to review its estimates, to fully calculate the emissions from CaC_2 production and use, and to attempt to estimate emissions using feedstock statistics and to fully describe the methods used in the NIR.

Ferroalloys production – CH_4

117. Poland reported CH_4 emissions from this category in its 2006 submission as not estimated ("NE"). The ERT notes the efforts made by Poland after the in-country review to calculate these emissions (0.08 Gg CH_4 in the base year). The ERT encourages Poland to include these revised estimates in its future emission inventory submissions and to provide suitable documentation on methods and EFs in future NIRs.

Other (zinc and lead production) – CO_2

118. Emissions from this category were reported as "NE" in the 2006 inventory submission for the entire time series. After the in-country review, Poland provided CO_2 emissions from zinc and lead production using the IPCC default EFs applied to AD for zinc and lead production from the GUS. The

ERT notes that these estimates are in accordance with the IPCC good practice guidance and improve the completeness of the inventory. These sources added 345.71 Gg CO_2 and 255.44 Gg CO_2 in the base year and in 2004, respectively. The ERT accepts these estimates and encourages Poland to include them with the supporting documentation in its future inventory submissions.

Consumption of halocarbons and SF_6 – HFCs, PFCs and SF_6

119. Emissions from the consumption of halocarbons and SF_6 are estimated using national statistics and surveys of importers and exporters. Although sufficient detail and explanations were presented during the in-country review, there is a lack of transparency in the NIR on the methods, assumptions and data sources. The ERT encourages Poland to provide a more detailed description of methods, data sources and assumptions in its next NIR and to report potential emissions for F-gases for the entire time series, and in particular for the base year and latest reported years.

7. Agriculture

Sector overview

120. In the Kyoto Protocol base year (1988 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6) emissions from the agriculture sector accounted for 9.0 per cent of total GHG emissions in Poland. CH_4 emissions from the sector contributed 35.7 per cent per cent of total CH_4 emissions, while N_2O emissions contributed 78.7 per cent of total N_2O emissions. Agricultural soils and enteric fermentation were the major agricultural categories, contributing 44.0 per cent and 30.9 per cent, respectively, to total of agriculture sector emissions in the base year. The categories rice cultivation and prescribed burning of savannas are reported using notation keys in the CRF tables, as rice is not cultivated and there are no savannas in Poland. However, they were reported both as "NE" and "NA" in the CRF tables. The ERT recommends Poland to correct the use of notation keys in its next submission.

121. As for the other sectors, the time series was estimated consistently for the first time in the 2006 GHG inventory submission. For 1988 the impact of the recalculations was not reported in the CRF tables of the original 2006 submission. For 2003 the impact of the recalculations was a 37.2 and 34.9 per cent increase in CH_4 and N_2O emissions, respectively, which affected all categories. The recalculations take into account the recommendations of the 2005 review report, were performed for the entire time series and were explained during the in-country review. As described in detail in the paragraphs below, revisions to the estimates were made after the in-country review that resulted in a decrease of the GHG emissions of the sector by 2.8 per cent in the base year, from 52,378.10 Gg CO_2 eq. to 50,893.90 Gg CO_2 eq. and a decrease by 5.5 per cent in 2004, from 34,261.71 Gg CO_2 eq. to 32,368.33 Gg CO_2 eq.

122. The NIR includes summary sector and category emissions data as well as reference lists for the methodologies used to develop estimates. However, reported information in the NIR on the methodologies, assumptions, and key input parameters used to calculate emissions is not transparent enough. Notation keys were not always properly used and no information was provided in the documentation boxes in the CRF tables. The ERT recommends Poland to use appropriate notation keys and provide information in the documentation boxes.

Key categories

Enteric Fermentation – CH_4

123. Poland uses a combination of tier 2 (for cattle and sheep) and tier 1 (for other animals) methods to estimate CH_4 emissions from enteric fermentation. For all categories of livestock populations the AD used are in agreement with Food and Agriculture Organization of the United Nations (FAO) published data. A combination of IPCC default and country-specific input parameters was used to develop the tier 2 EFs for cattle and sheep. For emissions estimation from cattle, Poland used enhanced characterization

of population, taking into account the age of the animals. However, the CRF tables include information on basic characterization, subdividing cattle only into dairy and non-dairy. During the in-country review, the key country-specific input parameters used to develop the EFs and the enhanced characterization data were made available to the ERT from background documents. The background documents show that the age splits of young animals were different for the 1988–1997 and 1998–2004 periods, introducing inconsistency into the time series. The ERT recommends Poland to improve the consistency of reporting livestock characterization in its next NIR and CRF tables and to ensure the consistency of AD used over the entire time series.

124. Poland used different sources of information for milk production for dairy cattle for 1988 and 1989 compared to the rest of the years in the time series. The value (9.58 kg/day) used for the base year is higher than the value published in the Statistical Yearbook of the Republic of Poland (8.9 kg/day) for 1988. For 1990–2004, the values published in the Statistical Yearbook are used. During the in-country review, the ERT considered that this might result in overestimation of CH_4 emissions in the base year. Thus the ERT requested Poland to revise emission estimates using consistent data sources over the entire time series and provide clear documentation of data sources used. After the in-country review, and following the recommendations of the ERT, Poland revised its estimates for this category. Data on milk production for dairy cattle from the Statistical Yearbook were used to revise the estimates for the base year and 1989. The revision resulted in a 2.6 per cent decrease in CH_4 emissions from dairy cattle from enteric fermentation in the base year (from 456.69 Gg to 444.91 Gg) and a minor 0.1 per cent increase in 2004 (from 260.71 to 261.03 Gg). The ERT considers this revision of estimates appropriate and encourages Poland to provide all the parameters and background information used for these estimates in the NIR of its next submission.

Manure management – N_2O

125. For estimating N_2O emissions from manure management Poland used a combination of country-specific and default parameters such as national data for manure managed in animal waste management systems (AWMs) for dairy cattle, non-dairy cattle and swine and IPCC default EFs and default values for nitrogen (N) excretion per head. The estimates are based on a basic characterization of animals due to the lack of country-specific data for manure managed in AWMS for young animals. The ERT encourages Poland to try to obtain such information for its next submission in order to ensure consistent use of animal characterization for the enteric fermentation and manure management categories in line with the IPCC good practice guidance.

Direct soil emissions – N_2O

126. Poland has applied the IPCC default methodology combined with country-specific EFs for synthetic fertilizers, animal manure applied to soils, N-fixing crops, and crop residue categories. Background documentation provided to the ERT during the in-country review shows that these parameters were derived from the results of regional measurement studies.[9] The ERT encourages Poland to document clearly in the NIR information on the derivation of country-specific EFs and to use the documentation box of CRF table 4.D for relevant information and references.

127. N_2O emissions from the animal manure applied to soils category (4.D.1.2) are estimated using methodology from the Revised 1996 IPCC Guidelines instead of the IPCC good practice guidance for the entire time series. The ERT considers that this may result in an underestimation of emissions in the latest reported year. During the in-country review, the ERT recommended Poland to use equation 4.23 in the IPCC good practice guidance to estimate of N_2O emission from this category. After the in-country review, and following the recommendations of the ERT, Poland revised its estimates from this category for the entire time series using the recommended equation. This revision resulted in an increase in N_2O

[9] Mercik, S. et al. 2001. Study on GHG emissions and sinks from arable land soil; Myczko A., 2001. Study on GHG emissions from enteric fermentation and animal manure in 1999 (in Polish).

emissions in the base year of 3.8 per cent (from 13.21 Gg to 13.72 Gg) and by 1.3 per cent in 2004 (from 8.96 to 9.08 Gg). The ERT considers this revision of estimates appropriate and encourages Poland to provide all the parameters and background information used for these estimates in the NIR of its next submission

128. Poland uses total peat land area in the country to calculate N_2O emissions from the cultivation of histosols category (4.D.1.5) instead of the cultivated area of histosols. This may lead to an overestimation of the emissions from this category over the entire time series including the base year. During the in-country review, the ERT recommended Poland to provide revised estimates for the entire time series based on cultivated area of histosols and clear documentation of the data sources used. After the in-country review, and following the recommendations of the ERT, Poland revised its estimates from this category using the available data for two years (1983 and 1999) from material published in 1988 (Oświt et al., 1989) and 2000 (Czaplak et al., 2000). Interpolation was used to estimate data for the period 1988–1999 and extrapolation was used to estimate data for 2000–2004. The revision has resulted in a decrease in N_2O emissions from the cultivation of histosols category in the base year by 27.8 per cent (from 15.95 Gg to 11.51 Gg) and by 39.2 per cent in 2004 (from 15.95 to 9.71 Gg). The ERT considers this revision of estimates and the background material provided appropriate and encourages Poland to include the new estimates and all the parameters and background information used for these estimates in the NIR of its next submission.

Indirect soil emissions – N_2O

129. Indirect soil emissions were estimated for the first time in the 2006 inventory submission. Poland applied the IPCC default method (tier 1a) in accordance with the comments in the previous (2005) review report. The ERT welcomes the efforts made by Poland to improve the completeness of its inventory in this category.

Non-key categories

Manure management – CH_4

130. Poland uses the tier 2 method for estimates for cattle, sheep and swine and a tier 1 method for other animal categories. In response to the comments from the previous (2005) review report, Poland revised the value for the methane correction factor for liquid management systems from 10 per cent (as in the Revised 1996 IPCC Guidelines) to 39 per cent (as in the IPCC good practice guidance). Country-specific input parameters were used to calculate gross energy, the volatile solid excretion rate for enhanced livestock characterization and for allocation to AWMS. The issue of the use of basic animal characterization instead of an enhanced one, discussed in paragraph 125 above, also applies also for this category.

8. Land use, land-use change and forestry

Sector overview

131. In the Kyoto Protocol base year (1988 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the LULUCF sector was a net sink of 32,926.48 Gg CO_2 eq., offsetting 5.8 per cent of total national GHG emissions in Poland. The net removals of the LULUCF sector decreased almost linearly from the base year to 2004 by 18.8 per cent. The sector is dominated by the category forest land remaining forest land, which is a net sink for the entire time series. The other categories in the sector had magnitudes of less than 20 per cent of the forest land remaining forest land in the base year. The decrease of the net removals of the LULUCF sector from the base year to 2004 was caused mainly by the decrease in net removals by living biomass in forest land remaining forest land by 16.6 per cent from the base year value of 23,709.18 Gg CO_2 and by soils of forest land remaining forest land by 12.5 per cent from the base year value 18,996.03 Gg CO_2.

132. The sector was recalculated in the 2006 submission in order to achieve a consistent time series from 1988 to 2004 and as a response to the recommendations of the 2005 review. However, the methodology used for the estimates was still not in compliance with the IPCC good practice guidance for LULUCF, since the calculations for all years were carried out using the Revised 1996 IPCC Guidelines. Applying this methodology, Poland used national AD and EFs that are partly country-specific and partly defaults from the Revised 1996 IPCC Guidelines. Thus, for example, emissions and removals from soil were calculated using the methods of the Revised 1996 IPCC Guidelines and then divided into the categories of the IPCC good practice guidance for LULUCF: forest land remaining forest land, cropland, grassland, and settlements. In calculating carbon stock changes in soils, different soil types (high activity, low activity, sandy and wetland) have been distinguished as required by the Revised 1996 IPCC Guidelines. However, the total area of different soil types needs to be constant in order to produce correct results with this method. The time that soil carbon stocks take to adjust after land-use change should also be considered (the default value in the Revised 1996 IPCC Guidelines is 20 years).

133. The results of the inventory have been entered into the CRF tables using a transition matrix that defines the correspondence of cells in the current CRF tables with those of the Revised 1996 IPCC Guidelines. Because the CRF tables for LULUCF in the 2006 submission used by Poland takes account of decision 13/CP.9, and the methodology and category split contained in the IPCC good practice guidance for LULUCF, the vast majority of the cells in the CRF tables for LULUCF do not contain any values, but are instead left empty or filled in with notation keys. In tables 5.A, 5.B, 5.C, and 5.E numerical data are reported on biomass and soil organic carbon only for land categories that maintain their land use. There were no estimates for dead organic matter. All other tables (tables 5.D, 5.F, 5(I) – 5(V)) and the cells for land transition (land converted to) in the abovementioned tables contain "NE" or "IE" notation keys.

134. During the in-country review, the ERT recommended that the inventory be prepared according to the IPCC good practice guidance for LULUCF for the entire time series. Recalculations should be made using methods based on choices according to decision trees of the IPCC good practice guidance for LULUCF, AD, EFs and key category analysis. The reporting should be expanded to cover the categories currently not reported by Poland, such as the land conversions. Implementation of QA/QC procedures, improved institutional cooperation and better documentation of the calculation procedures are essential to the improvement of the overall quality of the estimates in this sector.

135. After the in-country review, Poland provided a full set of CRF tables for LULUCF covering the period 1988–2004 calculated according to the IPCC good practice guidance for LULUCF, as well as a document describing the calculations. The revisions provided were not considered in this review and the values used in the report are those from the original 2006 submission. However, the ERT notes that the new estimates seem to resolve the problem related to that the methodology used by Poland was not consistent with the IPCC good practice guidance for LULUCF. New subcategories, for example, land converted to forest land and wetlands are also covered. However, the ERT could not review these new estimates and recommends Poland to include them in its future inventory submission. It should be noted that the overall result of the revisions is a reduction in the net removals from the sector from 32,926.48 Gg CO_2 eq. to 29,978.31 Gg CO_2 eq. in the base year and an increase in the net removals from 26,723.32 to 34,679.80 Gg CO_2 eq. in 2004.[10]

136. As is mentioned above, Poland applied a simplified tier 1 uncertainty analysis and a key category analysis which do not include the LULUCF sector. For this reason, this section of the report follows the key category analysis performed by the secretariat. The ERT recommends Poland to carry out key

[10] These revised figures for the LULUCF sector were included in a interim CRF tables provided to the ERT on 31July 2007. Following the recommendation of the ERT, in the final version of the CRF tables from 14 November 2007, the LULUCF sector values are as in the original 2006 GHG inventory submission.

category analysis that includes the LULUCF sector and to further analyse uncertainties of LULUCF subcategories for its next submission.

137. The LULUCF section of the NIR is rather brief and does not follow the structure suggested in the UNFCCC reporting guidelines. The calculations according to the Revised 1996 IPCC Guidelines are briefly explained, but there is not always a direct link between the values reported in the CRF tables and the NIR since the values have been entered into the CRF through a transition matrix, which may map a sum of two categories in one cell. The documentation boxes of the CRF have not been used to assist with transparency of the information reported. In addition, the use of notation keys is not always appropriate and is not explained in table 9(a). It is not possible, for example, to track where emissions from biomass burning have been reported. The ERT identified a number of mistakes in filling in the CRF tables (e.g. wrong cells filled, inappropriate use of notation keys) that were rectified during the in-country review. References to the background documents and literature are also almost completely missing in the NIR. As a result, the reporting is not transparent. The ERT recommends Poland to make further efforts to improve the transparency of reporting for the LULUCF sector, following closely the UNFCCC reporting guidelines, including detailed references to AD and EFs sources, verifying the use of notation keys in the CRF tables and making use of the documentation boxes. The ERT notes that in the revised CRF tables which Poland provided to the ERT after the in-country review, some of the recommendation had already been taken into consideration, such as the use of documentation boxes.

Key categories

Forest land remaining forest land – CO_2

138. Forest land remaining forest land represents a net sink for the entire time series, which decreased by 14.8 per cent in the 1988–2004 period (from 42,705.20 Gg CO_2 in 1988 to 36,398.99 Gg CO_2 in 2004). The estimates for forest land remaining forest land include carbon stock change in living biomass and in soils. The decrease in the net removals by living biomass reflects the changes in growth rates and harvests. However the carbon stock change in soils remained almost unchanged during the period 1988–2004.

139. The carbon stock change in living biomass was estimated using country-specific AD and EFs on the basis of information from the Statistical Year Book for Forestry for both state-owned and private forests. The data included forest area and volume tables with age classes. As national forest inventories (e.g. in years 2000 and 2003) are undertaken in Poland and detailed data are therefore available, the ERT encourages Poland to use these data to further disaggregate (e.g. climatic regions) the calculations in its future GHG inventory submissions.

140. The revised estimates for this category provide the information subdivided into forest land remaining forest land and land converted to forest land. The carbon stock change in dead organic matter is considered to be zero and reported as "NO", while estimates for carbon stock changes in living biomass and soils resulted in an overall decrease of net CO_2 removals for the base year.

Cropland remaining cropland – CO_2

141. Only soil carbon stock changes were reported under this category and it represented a net source of CO_2 emissions for the entire time series, increasing by 59.8 per cent in the period 1988–2004 from 8,165.36 Gg CO_2 in 1988 to 13,044.68 Gg CO_2 in 2004. The main reasons for this increase are changes both in the area of cropland and in soil types. The emissions and removals from soil were calculated using the methods contained in the Revised 1996 IPCC Guidelines and then divided into the categories of the IPCC good practice guidance for LULUCF, including cropland remaining cropland. During the in-country review, the ERT recommended that Poland make its estimates using the land use categories of the IPCC good practice guidance for LULUCF (cropland remaining cropland and land converted to cropland) as well as the methods specified for those land categories.

142. The ERT notes that the revised estimates provided after the in-country review for this category were made following the IPCC good practice guidance for LULUCF and also include carbon stock changes in living biomass. The ERT recommends Poland to include all this information in its next inventory submission.

Grassland remaining grassland – CO_2

143. Only soil carbon stock changes were reported under this category and it represented a net source of CO_2 emissions throughout the entire time series increasing by 59.8 percent in the period 1988–2004 from 4,530.68 Gg CO_2 in 1988 to 7,238.15 Gg CO_2 in 2004. These results are consistent with the approach of the Revised 1996 IPCC Guidelines being applied for estimating soil emissions. During the in-country review, the ERT recommended that Poland make its estimates using the land use categories of the IPCC good practice guidance for LULUCF (grassland remaining grassland and land converted to grassland) as well as the methods specified for those land categories.

144. Following this recommendation, after the in-country review, Poland provided information with changes for this category, reporting that the emission and removal balance for this category is zero. This statement needs further justification and documentation and the ERT recommends Poland to include the estimates, AD, parameters and further supporting information in its next NIR.

Settlements – CO_2

145. Settlements are identified as a key category for 2004 in the secretariat's key category analysis both by level and trend assessment, but are not a key category for 1988. For this category, only the estimates for carbon stock changes in soils are reported. This category was reported as a net sink that increased by 262.7 per cent over the 1988–2004 period (2,925.46 Gg CO_2 eq. in 1988 and 10,611.24 Gg CO_2 eq. in 2004). Settlements (as defined in the mapping of categories of the inventory made using the Revised 1996 IPCC Guidelines to the categories of the IPCC good practice guidance for LULUCF) comprise land areas that have been included in order to keep total land area constant. Highly diverse areas have therefore been included under the settlements category. The total area of settlements has increased in the period 1988–2004 by 35.3 per cent from 4,262.50 kha in 1988 to 5,770.50 kha in 2004.

146. During the in-country review, the ERT recommended that Poland make its estimates using the land use categories of the IPCC good practice guidance for LULUCF (settlements remaining settlements and land converted to settlements) as well as the methods specified for those land categories..

147. After the in-country review, and following the ERT's recommendation, this category was also revised, which resulted in a significant change. The revisions for the base year included carbon stock changes in soils reported as "NA" and "NE" and only carbon stock changes in living biomass from settlements remaining settlements being reported – as a net sink of 59.23 Gg CO_2 eq. The ERT recommends Poland to include this information in its next inventory submission.

Non-key categories

Wetlands, other land and biomass burning – CO_2, CH_4 and N_2O

148. The inventory estimates reported by Poland for the LULUCF sector are not complete, since they exclude wetlands, other land and biomass burning categories. The ERT recommends Poland to make efforts to estimate emissions/removals from these categories in its next inventory submission. The ERT also notes that the biomass burning from forest land remaining forest land is properly reported in table 5(V), which also includes estimates for CH_4 and N_2O emissions.

9. Waste

Sector overview

149. The waste sector contributed 1.5 per cent of total emissions in the Kyoto Protocol base year (1988 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6) and increased by 12.4 per cent between the base year and 2004 due to the increase in emissions of the solid waste disposal on land category. The waste sector reporting is almost complete with the exception of N_2O emissions from industrial wastewater. There is room for improving transparency in the NIR, for example, including references for EFs and detailing country-specific methodologies with better documented country-specific national parameters (e.g. for solid waste disposal land). No readily accessible information on recalculations was provided for the sector, although the figures in the CRF tables indicate important recalculations for 2003 (e.g. 1,462.1, –1.5 and 41.6 per cent changes for CO_2, CH_4 and N_2O emissions, respectively from the sector). For 1988 the impact of the recalculations was not reported in the CRF tables of the original 2006 submission. The ERT encourages Poland to provide recalculation information in accordance with the UNFCCC reporting guidelines in its next submissions, including numerical information on and detailed reasoning for the changes made within the CRF and the NIR. Basic QC procedures are in place, but no QA/QC procedures for the sector were reported in the NIR. A tier 1 uncertainty analysis was provided for 1988 and subsequent years and the results are provided in the NIRs, indicating uncertainty in the sector in the order of 50 per cent for CO_2 and N_2O emissions and over 70 per cent for CH_4. The NIR does not include information on sector-specific improvements. The ERT recommends Poland to develop a QA system (using, e.g. universities, research institutes, etc.) and the application of tier 2 uncertainty analysis where country-specific EFs and/or methodologies are used for its next submission.

150. As described in detail in the paragraphs below, revisions to the estimates were made after the in-country review that resulted in an increase of the GHG emissions of the sector by 2.5 per cent in the base year, from 8,197.19 Gg CO_2 eq. to 8,401,16 Gg CO_2 eq. and a decrease of 20.8 per cent in 2004, from 11,927.75 Gg CO_2 eq. to 9,446.94 Gg CO_2 eq.

Key categories

Solid waste disposal on land – CH_4

151. The methodology used by Poland to estimate CH_4 emissions from solid waste disposal on land is considered a tier 3 method. Poland applied a model to estimate the emissions for the first time and the ERT notes the efforts made by the Party to apply a higher tier consistent with the recommendations of the IPCC good practice guidance for key categories. However, the ERT analysed some of the country-specific EFs used and found that they were not well documented in the NIR. The references indicated in the NIR did not show the calculation used to obtain the country-specific values. This is particularly important for the methane generation rate constant values (k values) applied in calculations, which for the various waste types were generally lower than the IPCC default values (e.g. for food waste the default value is 0.184, while the country-specific value is 0.086). During the in-country review, the ERT recommended Poland to document these country-specific parameters or to apply the IPCC good practice guidance default values for the cases where the country-specific parameters cannot be documented. In response to this recommendation, after the in-country review, Poland revised its estimates using the IPCC default values for k for the entire time series (e.g. 0.184 for food waste, 0.1 for garden wastes, 0.06 for paper, 0.03 for wood and straw and 0.06 for textiles).

152. Industrial solid waste was not included separately in the estimates and estimates for it are based on statistical data and IPCC default EFs. Waste composition used in the estimates was based on the National Plan on Waste Management and did not reflect the changes in composition over the time series. The ERT recommends Poland to make efforts to collect data on present and previous waste composition, as well as the fraction of landfilled municipal waste for its next submissions. In response to the recommendation, Poland provided a new country-specific data source for waste distribution in 1985

(Podstawy Gospodarki Odpadami). Based on those data and on data from National Plan on Waste Management for 2001, interpolation for the 1970–2004 period was made and emissions estimations were revised. The total revisions made by Poland for this category resulted in a 15.2 per cent increase of CH_4 emissions from 204.01 Gg to 234.97 Gg for the base year, and an almost negligible increase of 0.8 per cent for 2004, from 321.32 Gg to 323.95 Gg. The ERT agreed with the revised values. However, for technical reasons revisions based on changes of waste composition were not included in the revised CRF and the ERT recommends that Poland further refine these estimates and include them in future submissions.

Wastewater handling – CH_4

153. Poland has developed and improved its methodology for CH_4 emission estimates for industrial wastewater handling, but this methodology was only applied for the base year which creates inconsistency in the time series. During the in-country review, the ERT was provided with information related to industrial wastewater AD and EFs, which were not reconciled with those used in the methodology applied. Poland also provided information on data for CH_4 emission estimations for domestic and commercial wastewater handling based on a national study.[11] The ERT recommended Poland to revise the entire time series and to better document the methodology applied in the NIR, as well as to verify the values used for industrial wastewater handling. Following the recommendation of the ERT, after the in-country review Poland provided revised estimates using the Revised 1996 IPCC Guidelines and AD from the Statistical Yearbooks. The revision resulted in a decrease in the CH_4 emissions from industrial wastewater treatment by 41.9 per cent from 50.75 Gg to 29.50 Gg in the base year and a decrease by 92.9 per cent from 130.06 Gg to 9.30 Gg in 2004. The new methodology accounts for sludge and CH_4 recovery. The ERT agreed with the revised values.

Non-key categories

Wastewater handling – N_2O

154. N_2O emissions from wastewater handling only include emissions from human sewage, which are estimated in line with the Revised 1996 IPCC guidelines. N_2O from industrial wastewater is reported as "NE". The ERT encourages Poland to consider the methodology used by other countries with similar conditions and to include those emissions in its future submissions.

Waste incineration – CO_2 and N_2O

155. Poland applies the IPCC good practice guidance methodology to estimate the emissions from this category in combination with default and country-specific EFs and AD from national statistics and national studies.[12] Estimates are made for municipal, industrial, medical waste and sewage sludge incineration and resulting CO_2 and N_2O emissions are reported in the CRF tables. The ERT recommends Poland to apply the IPCC good practice guidance consistently in its next inventory submission, specifically in the use of consistent time-series data, and to revise the entire time series for industrial waste incineration, both for CO_2 and N_2O. The energy sector statistics show the use of waste for energy purposes but no indication was provided of such use in the NIR under the waste sector methodology description part. The waste sector methodology description part requires a clear indication of where information for this category can be found in the NIR.. Clear references should also be included in the next Polish NIR for incinerated waste with and without energy recovery.

[11] Bernacka J., Pawłowska L. Elaboration and analysis of data regarding GHG emissions from municipal wastewater management. Institute of Environmental Protection, 2005 (in Polish).

[12] Wielgosiński G. Estimation of data and update of methodology for pollutants emissions inventory from waste combustion (in Polish).

C. Calculation of the assigned amount

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

157. Poland's base year is 1988 and Poland has chosen 1995 as its base year for HFCs, PFCs and SF_6. Poland's quantified emission reduction commitment is 94 per cent as included in Annex B to the Kyoto Protocol.

158. Based on Poland's base year emissions (586,902.634 Gg CO_2 eq.) and its Kyoto Protocol quantified emission reduction commitment (94 per cent), Poland in its initial report originally calculated its assigned amount to be 2,758,442,380 tonnes CO_2 eq.

159. In response to inventory issues identified during the review and in accordance with the recommendations of the ERT, Poland submitted revised estimates of its base year inventory – 563,442.774 Gg CO_2 eq. – which resulted in a revised calculation of the assigned amount. Based on the revised estimates, Poland calculates its assigned amount to be 2,648,181,038 tonnes CO_2 eq. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

160. 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.

161. In its initial report, based on its national emissions in the most recently reviewed (2004) inventory – 388,472.885 Gg CO_2 eq. – Poland originally calculated its commitment period reserve to be 1,942,364,425 tonnes CO_2 eq. The ERT disagreed with this figure, because Poland included in its 2004 inventory total emissions of HFC-365mfc and HFC-245fa, gases with global warming potential (GWP) not adopted by the CMP and which should be reported only for informational purposes and because the value reported in the initial report for the national emissions in the 2004 inventory did not correspond to the value reported in the CRF tables of the 2006 submission (396,650.643 Gg CO_2 eq.).

162. In response to inventory issues identified during the review Poland submitted revised estimates of its most recently reviewed (2004) inventory – 388,482.155 Gg CO_2 eq. – and a revised calculation of its commitment period reserve. Based on the revised estimates, Poland calculates its commitment period reserve to be 1,942,410,776 tonnes CO_2 eq. The ERT agrees with this figure.

E. National registry

163. Poland 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) in its initial report. The information provided is transparent and in accordance with the requirements of these reporting guidelines.

164. During the in-country review, the ERT was provided with additional background material on the national registry of Poland including: an overview of how procedures are kept up to date, the document "Polish National Registry for GHG Emissions Warsaw 2007-05-25", procedural documents and administrative activity logs and guidance material for users. The ERT recommends Poland to provide a summary of this information in its next submission under the Kyoto Protocol.

165. Table 5 summarises the information on the mandatory reporting elements on the national registry system, as stipulated by decision 15/CMP.1, which describes how its national system performs functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1.

Table 5. Summary of information on the national registry system

Reporting element	Provided in the initial report	Comments
Registry administrator		
Name and contact information	Yes	Mr Pawel Salek, Institute of Environmental Protection, 4 Kolektorska Street, 01-692 Warsaw Pawel.Salek@kashue.pl
Cooperation with other Parties in a consolidated system		
Names of other Parties with which Poland cooperates, or clarification that no such cooperation exists.	Yes	Poland uses the SERINGAS software system in collaboration with Germany, the Czech Republic, France, Slovakia, Greece, Spain and Belgium, however the registry is not operated in consolidated form with these Parties.
Database structure and capacity of the national registry		
Description of the database structure	Yes	
Description of the capacity of the national registry	Yes	
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems	Yes	Covered in the independent assessment report (IAR)[a]
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 Poland's national registry	Yes	<https://rejestr.kashue.pl>
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	Test results covered in the IAR

[a] Pursuant to decision 16/CP.10, the administrator of the international transaction log (ITL), once registry systems become operational, 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 the annual report to the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

166. During the in-country review, the ERT was informed that the internal operational test of the registry for network connection was completed on the 16 May 2006. The initialization process was expected to be completed by September 2007 and the registry was expected to be fully operational by

30 September 2007. After the in-country review, Poland notified the ERT that the initialization test was completed on 28 November 2007. Information on the registry is publicly available through the Internet at URL <https://rejestr.kashue.pl>.

167. The ERT was also informed of the procedures and security measures to minimize discrepancies, terminate transactions and correct problems, and minimize operator error. These procedures and security measures included documents describing the actions required in the event of problems with the systems or user accounts that include checking, notification of problems, management communication and technical response.

168. The ERT acknowledged the effort made by Poland to put in place these procedures and security measures. The ERT gained the overall impression that Poland attached adequate importance to, and allocated adequate resources, including human resources, to the development, operation and maintenance of the registry.

169. 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 5 December 2007.

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

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

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

172. Table 6 shows Poland'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	10%	
Minimum land area	0.1 ha	
Minimum tree height	2 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3 activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4 activities		
Forest land management	Elected	Commitment period
Cropland management	Not elected	Not applicable
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

173. The elected parameter values for the definition of forest are within the ranges prescribed in paragraph 1(a) of the annex to decision 16/CMP.1. In addition to the mandatory parameters in the definition of forest, Poland provides in its initial report a minimum width of forest area of 10 metres defined by the methodology of the current forest inventory in the country. The ERT considers Poland to be in a position to report under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in accordance with the choices it has made.

III. Conclusions and recommendations

A. Conclusions

174. The information provided by Poland in its initial report covers most of the elements required by 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. Additional information on all elements was provided to the ERT during and following the in-country review.

175. Poland's national system is generally prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1) and reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1). During the in-country review, the ERT noted that the presentation of some of the mandatory elements of the national system was not fully in line with Article 5.1 of the Kyoto Protocol and requested Poland to further develop its archiving system, provide a procedural manual for the management and maintenance of the archiving system, further elaborate its existing QA/QC plan in line with the requirements of IPCC good practice guidance, including a summary of the implemented QA/QC activities, and to provide copies of formal documents establishing the legal basis for the compilation and delivery of the inventory under the UNFCCC.

176. After the in-country review, Poland provided further and additional information showing that the required improvements to the national system are in place or in progress towards full implementation. The ERT is satisfied with the information provided and the efforts made by Poland to address the issues raised during the review.

177. Poland has provided its GHG inventory data for the base year (1988 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6) and the years 1988–2004, including most of the tables required with data on all relevant gases and categories. The ERT noted that this was the first inventory reported by Poland providing a full time series using the CRF tables and applying methodologies consistent with the UNFCCC reporting guidelines, the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. However, during the in-country review, the ERT identified various inventory-related problems and, in particular, a number of categories where the methods, EFs or AD used were not fully in accordance with the IPCC good practice guidance, which might lead to an overestimation of emissions in the base year or an underestimation of emissions in the most recent years. The ERT recommended Poland to revise its estimates for these categories.

178. After the in-country review, Poland provided revised estimates and/or additional documentation, including improved estimation methods, AD and/or enhanced transparency for a number of categories for the entire time series and particularly for the base year and 2004.

179. The ERT notes that Poland provided timely and thorough replies to its questions concerning potential problems, following the ERT's recommendations and in line with the relevant reporting guidelines, in particular the IPCC good practice guidance, and CMP decisions. In all cases the information provided by Poland satisfied the ERT.

180. The ERT did not recommend the application of adjustments in any inventory category to Poland's GHG inventory and noted that the assigned amount pursuant to Article 3, paragraphs 7 and 8, is

calculated in accordance with the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol (decision 13/CMP.1), and is consistent with the revised base year inventory estimates submitted during the review. Taking into account Poland's election of 1988 as base year for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs and SF_6, and its Kyoto Protocol quantified emission reduction commitment (94 per cent), the ERT confirms that Poland's assigned amount based on its revised base year emissions (563,442.774 Gg CO_2 eq.) is 2,648,181,038 tonnes CO_2 eq. The ERT agrees with this figure.

181. 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. The ERT confirms that Poland's commitment period reserve based on its revised 2004 emissions (388,482.155 Gg CO_2 eq.) is 1,942,410,776 tonnes CO_2 eq. The ERT agrees with this figure.

182. Poland identified all the required information on parameters and elections for LULUCF under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its initial report. Poland selected as parameters for forest definition 10 per cent of minimum tree cover, 0.1 ha of minimum land area and 2 metres as minimum tree height. These parameters are within the ranges established under decision 16/CMP.1. Forest land management is the only article 3, paragraph 4, activity elected by Poland. Poland has chosen to account for LULUCF activities for the entire commitment period.

183. Poland provided information on its national registry as required by Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). The ERT believes that the resources attached to the technical and administrative operation of the registry are sufficient. During the in-country review, the ERT was provided with additional and updated information on the national registry. The information provided is transparent and in accordance with the guidelines.

184. During the in-country review, the registry was still not operational, but the initialization process was already under way. Based on the results of the technical assessment, as reported in the independent assessment report, the ERT concluded that Poland's national registry is fully compliant with the registry requirements as defined by decisions 13/CMP.1 and 15/CMP.1.

B. Recommendations

185. In the course of the review, the ERT formulated recommendations based on the information presented in the initial report and related to the national system or related to the 2006 inventory submission. Most of the recommendations were implemented during the review process and the potential problems that could have led to overestimations of emissions in the base year have been resolved. The remaining key cross-cutting and inventory recommendations[13] are that Poland:

(a) Adopt the draft Act on instruments supporting the reduction of GHG emissions and other substances that will strengthen the clear and independent legal basis for the national system and report on its adoption in its next submissions under the Kyoto Protocol;

(b) Provide more precise descriptions of its NIR under the Kyoto Protocol as well as documentation on the legal, institutional and procedural arrangements for inventory preparation, as well as information on the QA/QC activities and procedures implemented;

(c) Continue to develop the archiving system, ensuring that it is centralized, indexed and secure and has sufficient capacity to organize and maintain all the necessary electronic information of inventory submissions and the supporting information (electronic and hard copies) required to produce the national emission inventory estimates;

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

(d) Formalize and document procedures for prioritizing inventory improvements;

(e) Further document QA/QC activities in accordance with the UNFCCC reporting guidelines, and elaborate the QA/QC plan as well as QA/QC procedures for activities related to Article 3, paragraphs 3 and 4, of the Kyoto Protocol;

(f) Strengthen its institutional capacity by ensuring adequate long-term financial support for inventory-related contracts and arrangements and by encouraging inventory experts to attend the UNFCCC training courses and participate in the review process;

(g) Collect country-specific AD and develop well-documented country-specific EFs for use with higher tier methods for key categories;

(h) Use more country-specific information in calculations of uncertainties and include the qualitative discussions on uncertainty of the data used for all categories, and in particular for key categories, in its next NIR;

(i) Ensure that any future recalculations are consistently made, presented for all the years of the inventory, prepared in accordance with the IPCC good practice guidance and fully documented in its future NIRs;

(j) Submit a single NIR covering the entire time series and following the structure outlined in the UNFCCC reporting guidelines, including more comprehensive and precise descriptions and documentation of methodologies and EFs that differ from those of the IPCC, and providing better explanations of the emissions trends and information on cross-cutting issues;

(k) Improve the completeness of CRF tables by including tables 8(a) and 8(b) (recalculations), tables 9(a) and 9(b) (completeness) as well as systematic use of notation keys and better use of documentation boxes;

(l) Improve consistency of its reporting by cross-checking the information provided in the NIR with that in the CRF tables.

186. The most important sectoral issues that need to be addressed in the future reviews are:

(a) LULUCF sector estimates shall be in accordance with the IPCC good practice guidance for LULUCF for the entire time series;

(b) The robustness of the energy balance data and consistent use of its energy data throughout the inventory.

C. Questions of implementation

187. No question of implementation has been identified by the ERT during the initial review.

Annex I

Documents and information used during the review

A. Reference documents

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UNFCCC secretariat. Poland: Independent assessment report of the national registry of Poland. Reg_IAR_POL_2007_1. Will be available at: <www.unfccc.int>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Krzysztof Olendrzynski, Ms. Anna Olecka, Ms. Iwona Kargulewicz and the other members of the inventory team in the National Emission Center, including additional material on the methodology and assumptions used. Excel working files and access to the reference materials were also provided when needed to the ERT for all sectors.

References used for cross-cutting issues

Act of 22 Dec 2004 (Art.9) on the emission allowance trading system for greenhouse gases and other substances (Dz. U. Nr 281, p.2784)

Agreement Nr 04/Wn50/D on the detailed tasks of the National Administration of the Emission Trading Scheme resulting from Article 9 § 2 of the Act of 22 Dec 2004, signed in Warsaw on 21 February 2006 between the Minister of Environment, Institute of Environmental Protection, and the National Fund for Environmental Protection and Water Management.

Draft act on instruments supporting the reduction of GHG emissions, 12 April 2007 National Emission Centre (Anna Olecka, Krzysztof Olendrzynski). Draft of the National programme for Quality Assurance and Quality Control of the Polish Greenhouse Gas emission inventory, Warsaw 2007

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National Emission Centre (Jacek Skoskiewicz). Data Management Manual, Warsaw 2007

Ordinance of Council of Ministers of 13/09/2005 to the Act of 22 Dec 2004

Letter of approval of the National Programme for QA/QC sent by the Ministry of Environment, Warsaw 14 November 2007.

References used for the national registry

Help Desk structure List of Administrators of National Registry

Instruction for servicing incidents: Unavailability of the International Transaction Log or a technical problem the source of which is the Community Independent Transaction Log

Polish and English translations of procedures and guidance including: Administration procedure for opening an account in the National Registry; Authorization procedure via telephone; Blocking the access to the account; Unblocking the account access; Generating a new registry access password for the person authorized to access the registry; Sending a login to the person authorized to access the registry; Procedure for servicing incoming and outgoing post of the national registry; Procedure for creating the symbols for the installations and permits in the national registry; Procedure for entering verified emission into the registry system

Polish National Registry for GHG Emissions. Warsaw 2007-05-25

Reconciliation of the Community Independent Transaction Log's (CITL) and national registry (KRU) databases.

References used for the energy sector

Original background calculation files 1.A.1.xls, 1.A.2.xls, 1.A.3.xls, 1.A.4.xls, 1.A.5.xls, GPe 88-89.dpf, C balance for coke production 1988-2005.xls, Zuz nieenerget 88-branze i dzialy.xls, G03 – 1988.xls, 1BEmisja lotna gaz i ropa.xls, bilans paliw 1988.xls

Updated background calculation files: 1.A.1.-cor-x.xls, 1A2-cor-X.xls, 1A2 coke correction-X.xls, 1A3-cor-X, 1A4-cor-X+A5.xls, C balance for coke production -GPE-Revised.xls, BF-12X- Revised 1996.xls

Poland response to ERT list of potential problems final 19-10-07.doc; Poland response to ERT list of potential problems ver-2.doc; Poland response to ERT list of potential problems ver-4 response PL.doc

GOSPODARKA PALIWOWO-ENERGETYCZNA w latach 1998-1999, Warszawa, lipiec 1990,

Opracowanie I analiza wybranych danych dotyczacych zuzycia paliw w gospodarce polskej u latach 1998–2005

Carbon emission factors of coal and lignite: analysis of Czech coal data and comparison to European values, Pavel Fott, Environmental science & Policy 2 (1999) 347-354

References used for the industrial processes sector

A number of files and their dates, times of update and sizes have been provided including: 1988 comparison of previous and new submissions.xls; BF input correction.pdf; BF-12X- Revised 1996.xls; BF-12X-EN.xls; BF-correction-1.xls; bilans C dla koksowni 1988-2005 - korekta wg GPE EN.xls; bilans C dla koksowni 1988-2005.xls; Blast Furnaces Process correction 18-09-07.doc; C balance for coke oven -new.xls; C balance for coke production -GPE-Revised.xls; cast production - Holtzer.doc; cement - analiza EF z materialow do HE.xls; CO2-Emission PL HIPH.pdf; GPE 88-89.pdf; MG-08-instrukcja.doc; Mg_08.xls; NH3 production.xls; NH3- according to G03-1.xls; NH3- according to G03-26-09-07.xls; NH3- according to G03.xls; NH3- according to G03_1.xls; POL-2007-1988-v2.1.xls; Poland response to ERT list of potential problems final 19-10-07.doc; Poland response to ERT list of potential problems ver-2.doc; Poland response to ERT list of potential problems ver-4 response PL.doc; Produkcja stali martenowskiej 1988.jpg; Produkcja stali martenowskiej cd 1988.jpg; Sector 2 88-05.-new-X.xls; Sector 2 88-05.-new.xls; Sektor 2 88-05.xls; spiekalnie - obliczenia EF.xls; Steel Association report-ERT.xls; Steel Association report.xls; Strona tyt. wewnetrzna 1988.jpg; Strona tytulowa 1988.jpg; Wiwlkie piece-bilans C.xls; Wskazniki stalownia konwertorowa 1988.jpg

References used for the agriculture sector

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Materiały i opracowania statystyczne: pogłowie zwierząt gospodarskich oraz struktura i wybrane elementy stada w 1988 r. (w 1989 r.). GUS, 1989, 1990. (EN: Statistical materials and elaborations: livestock population, structure and selected elements of herd in 1988. (…in 1989). Central Statistical Office, 1989, 1990

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Explanation concerning Sector 5. LULUCF, submitted by Poland in response to a recommendation under the review of the greenhouse gas inventory carried out by the experts' team from the UNFCCC Secretariat on 11-16.06.2007 in Poland. Print of four pages.

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Lasy Państwowe, Raport Roczny 2005. Państwowe Gospodarstwo Leśne. Warszawa 2006, ISSN 1641-3210.

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Transition Matrix from IPCC 1997 Revised to new IPCC GPG LULUCF 2003 (one page print).

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Annex II

Acronyms and abbreviations

AD	activity data
ARE	Agency of Energy Market
AWMS	animal waste management system
Bo	methane producing capacity
BULiGL	Office for Forest Planning and Management
CH_4	methane
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
EC	European Community
EIT	economy in transition
EF	emission factor
ERT	expert review team
ETS	emissions trading scheme
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
F-gas	fluorinated gas
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)
GPE	Gospodarka Paliwowo-Energetyczna (energy statistics in Poland)
GUS	Central Statistical Office (Poland)
GWP	global warming potential
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IEP	Institute of Environmental Protection
ITL	international transaction log
ITS	Institute of Automobile Transport
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
MEW	Ministry for Environment and Water
Mg	megagram (1 Mg = 1 tonne)
MoE	Ministry of Environment
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
NEC	National Emission Center
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
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

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