United Nations FCCC/ARR/2010/POL

Framework Convention on Climate Change

Distr.: General
4 April 2011

English only

Report of the individual review of the annual submission of Poland submitted in 2010*

* In the symbol for this document, 2010 refers to the year in which the inventory was submitted, and not to the year of publication.

Contents

I. Introduction and summary

A. Overview

1. This report covers the centralized review of the 2010 annual submission of Poland, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 6 to 11 September 2010 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Riccardo de Lauretis (Italy) and Mr. Teemu Oinonen (Finland); energy – Ms. Ana Carolina Avzaradel (Brazil), Mr. Javier González Vidal (Spain) and Ms. Chia Ha (Canada); industrial processes – Mr. Stanford Mwakasonda (South Africa) and Ms. Detelina Petrova (Bulgaria); agriculture – Ms. Junko Akagi (Japan) and Ms. Janka Szemesova (Slovakia); land use, land-use change and forestry (LULUCF) – Ms. Oksana Butrym (Ukraine), Mr. Aquiles Neuenschwander (Chile) and Mr. Atsushi Sato (Japan); and waste – Mr. Qingxian Gao (China), Mr. Pavel Gavrilita (Republic of Moldova) and Ms. Zivile Paskauskaite (Lithuania). Mr. de Lauretis and Mr. Mwakasonda were the lead reviewers. The review was coordinated by Ms. Barbara Muik and Ms. Astrid Olsson (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, into this final version of the report.

B. Emission profiles and trends

3. In 2008, the main greenhouse gas (GHG) in Poland was carbon dioxide (CO_2), accounting for 82.0 per cent of total GHG emissions[1] expressed in CO_2 eq, followed by methane (CH_4) (9.1 per cent) and nitrous oxide (N_2O) (8.0 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.0 per cent of the overall GHG emissions in the country. The energy sector accounted for 79.8 per cent of total GHG emissions, followed by the agriculture sector (9.3 per cent), the industrial processes sector (8.4 per cent), the waste sector (2.2 per cent) and the solvent and other product use sector (0.2 per cent). Total GHG emissions amounted to 397,046.06 Gg CO_2 eq and decreased by 29.6 per cent between the base year[2] and 2008. Between 2007 and 2008 total GHG emissions decreased by 1.1 per cent.

4. Tables 1 and 2 show GHG emissions from Annex A sources, emissions and removals from the LULUCF sector under the Convention and emissions and removals from activities under Article 3, paragraph 3, and, if any, Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector, respectively. In table 1, CO_2, CH_4 and N_2O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

5. Table 3 provides information on the most important emissions and removals and accounting parameters that will be included in the compilation and accounting database.

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

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1988 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources only.

Table 1

Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year to 2008[a]

			Gg CO_2 eq								*Change*
		Greenhouse gas	*Base year*	*1990*	*1995*	*2000*	*2005*	*2006*	*2007*	*2008*	*Base year–2008 (%)*
Annex A sources		CO_2	470 521.45	368 409.10	365 910.17	320 727.00	319 285.68	330 916.35	328 511.44	325 381.14	–30.8
		CH_4	51 940.41	46 093.16	43 049.43	38 898.02	37 577.65	37 835.64	36 973.64	36 044.49	–30.6
		N_2O	41 339.08	38 603.08	31 012.29	29 714.76	29 795.67	30 906.27	32 040.69	31 697.77	–23.3
		HFCs	26.44	26.44	26.44	594.61	3 015.65	3 045.15	3 488.91	3 661.75	13 748.6
		PFCs	252.24	252.24	252.24	248.87	259.95	269.75	298.65	226.45	–10.2
		SF_6	30.53	30.53	30.53	24.18	28.09	34.80	32.66	34.46	12.9
KP-LULUCF	Article 3.3[b]	CO_2								–3 654.05	
		CH_4								NO	
		N_2O								NO	
	Article 3.4[c]	CO_2	NA							–46 901.02	NA
		CH_4	NA							32.05	NA
		N_2O	NA							3.81	NA

Abbreviations: KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1988 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1988.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation the base year and the inventory years of the commitment period must be reported.

Table 2
Greenhouse gas emissions by sector and activity, base year to 2008

			Gg CO_2 eq								*Change*
		Sector	*Base year*[a]	*1990*	*1995*	*2000*	*2005*	*2006*	*2007*	*2008*	*Base year–2008 (%)*
Annex A		Energy	469 271.27	368 742.99	368 735.86	321 380.01	316 379.01	325 752.64	321 265.16	316 957.28	–32.5
		Industrial processes	32 611.71	23 573.89	23 040.18	22 892.47	28 876.78	31 096.44	32 911.51	33 322.39	2.2
		Solvent and other product use	1 006.46	629.23	524.80	616.09	688.81	762.36	733.04	742.04	–26.3
		Agriculture	51 854.38	50 776.06	38 008.82	35 427.89	34 580.74	36 061.13	37 126.66	37 113.08	–28.4
		Waste	9 366.32	9 591.25	9 971.42	9 890.97	9 437.36	9 335.39	9 309.64	8 911.28	–4.9
		Other	NO	NO	NO	NO	NO	NO	NO	NO	NA
		LULUCF	NA	–23 052.60	–20 822.38	–24 457.53	–36 219.35	–40 795.04	–42 807.77	–39 163.91	NA
		Total (with LULUCF)	**NA**	**430 260.82**	**419 458.70**	**365 749.90**	**353 743.35**	**362 212.92**	**358 538.23**	**357 882.15**	**NA**
		Total (without LULUCF)	**564 110.14**	**453 313.42**	**440 281.08**	**390 207.44**	**389 962.70**	**403 007.96**	**401 346.00**	**397 046.06**	**–29.6**
KP-LULUCF	Article 3.3[b]	Afforestation & reforestation								–3 916.74	
		Deforestation								262.68	
		Total (3.3)								**–3 654.05**	
	Article 3.4[c]	Forest management								–46 865.16	
		Cropland management	NA							NA	NA
		Grazing land management	NA							NA	NA
		Revegetation	NA							NA	NA
		Total (3.4)	**NA**							**–46 865.16**	**NA**

Abbreviations: LULUCF = land use, land-use change and forestry, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1988 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1988.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, namely forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation the base year and the inventory years of the commitment period must be reported.

Table 3
Information to be included in the compilation and accounting database in t CO_2 eq

	As reported	*Adjustment*[a]	*Final*[b]	*Accounting quantity*[c]
Commitment period reserve	1 994 527 271		1 985 230 315	
Annex A emissions for current inventory year				
CO_2	323 893 541		325 381 144	
CH_4	36 044 493		36 044 493	
N_2O	31 697 770		31 697 770	
HFCs	3 661 748		3 661 748	
PFCs	226 452		226 452	
SF_6	34 456		34 456	
Total Annex A sources	**395 558 460**		**397 046 063**	
Activities under Article 3, paragraph 3, for current inventory year				
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	–3 671 660		–3 916 735	
3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported	NA, NO		NA, NO	
3.3 Deforestation for current year of commitment period as reported	154 040		262 683	
Activities under Article 3, paragraph 4, for current inventory year[d]				
3.4 Forest management for current year of commitment period	–7 298 666		–46 865 159	
3.4 Cropland management for current year of commitment period				
3.4 Cropland management for base year				
3.4 Grazing land management for current year of commitment period				
3.4 Grazing land management for base year				
3.4 Revegetation for current year of commitment period				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the ERT has calculated one or several adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] "Accounting quantity" is included in this table only for Parties that chose annual accounting for activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, if any.
[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

6. The 2010 annual inventory submission was submitted on 15 April 2010; it contains a complete set of common reporting format (CRF) tables for the period 1988–2008 and a national inventory report (NIR). Poland resubmitted its CRF tables and KP-LULUCF CRF tables on 26 May 2010 and its NIR on 27 May 2010. In this last submission, Poland also included information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry, and minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 13 April 2010. The annual submission was submitted generally in accordance with decision 15/CMP.1. The ERT recommends that Poland submit its complete inventory by 15 April 2011 as required by decision 15/CMP.1.

7. Poland officially submitted revised emission estimates on 21 October 2010, and a revised version of the NIR on 25 November 2010, in response to questions raised by the expert review team (ERT) during the course of the centralized review. The values in this report are based on the submission of 21 October 2010.

8. In addition, the ERT used the standard independent assessment report (SIAR), parts I and II, to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.[3] Where necessary, the ERT also used the previous year's submission during the review.

9. During the review, Poland provided the ERT with additional information and documents which are not part of the annual submission but are in many cases referenced in the NIR. The full list of information and documents used during the review is provided in annex I to this report.

Completeness of inventory

10. The inventory is complete in terms of years and geographical coverage and covers all source and sink categories for the period 1988–2008. Poland reported as not estimated ("NE") fugitive CH_4 emissions from post-mining activities in surface mines, fugitive CH_4 emissions from coal mines recovered or flared, CO_2 fugitive emissions from mining and post-mining activities, carbon stock changes and non-CO_2 emissions in settlements and wetlands converted to cropland, forest land converted to grassland, grassland converted to wetlands, drainage of forest soils, disturbance associated with land-use conversion to cropland, and biomass burning in forest land. In addition, potential emissions for fluorinated gases (F-gases) for all years are reported as not occurring ("NO") or not applicable ("NA"). The ERT recommends that the Party provide estimates for these categories in its next annual submission, in order to improve completeness, giving priority

[3] The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5(a), 6(c) and 6(k)), under the auspices of the international transaction log administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry.

to the missing categories especially in the LULUCF sector for which there are estimation methodologies in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). CRF table 8(b) on explanations for recalculations was not completed and CRF table 9(a) was only partially completed, with many of the explanations of "NE" and "IE" (included elsewhere) missing. The ERT recommends that the Party complete the reporting of CRF tables 8(b) and 9(a) in its next annual submission.

2. A description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Overview

11. The ERT concluded that the national system continues to perform its required functions.

12. The Party described, in the NIR, the changes to the institutional arrangements which occurred in 2009 following the previous annual review, mainly the new legislation introduced to ensure that Poland complies with the international commitments on air emissions; these changes are briefly discussed in paragraph 114 of this report. No further changes to the national system occurred in 2010.

Inventory planning

13. The NIR described the institutional arrangements for the preparation of the inventory. Since October 2009, the National Centre for Emission Management (KOBiZE) and, in particular, the Emission Balancing and Reporting Unit, has overall responsibility for the national inventory. Emission calculations, choice of activity data (AD), emission factors (EFs) and methodologies are performed by KOBiZE. Other institutions, such as the Central Statistical Office, the Agency of the Energy Market, the Institute of Ecology of Industrial Area of Katowice, the Motor Transport Institute and the Office for Forest Planning and Management, collaborate in the preparation of the inventory, mainly providing AD for inventory estimates. KOBiZE also has access to the data provided in the framework of the European Union emissions trading scheme (EU ETS). Prior to the submission, the inventory undergoes an internal process of official consideration and final approval by the Ministry of Environment. A quality assurance/quality control (QA/QC) programme has been elaborated to improve and assure the high quality of the annual GHG inventory and KOBiZE is also responsible for coordinating and implementing QA/QC activities. During the review, Poland responded quickly and efficiently to questions raised by the ERT. The ERT considers that the national system is generally effective and reliable.

Inventory preparation

Key categories

14. Poland has reported a key category tier 1 analysis for 2008, both level and trend assessment, as part of its 2010 submission. The key category analysis performed by the

Party and that performed by the secretariat[4] produced similar results. Poland has included the LULUCF sector in its key category analysis, which was performed in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The results of the key category analysis are a driving factor for the prioritization of improvements to the inventory. Poland is planning to supplement its key categories analysis by implementing a qualitative approach. The ERT encourages Poland to continue with its planned improvements.

15. Poland has not reported a key category tier 1 analysis for the base year and the ERT recommends that Poland report this and also recommends that the Party compile CRF table 7 in its next annual submission. In addition, the ERT encourages Poland to provide a key category tier 2 analysis according to the methodologies provided by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF in the next annual submission.

16. Poland provided a key category analysis for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, following the guidance on establishing the relationship between the activities under the Kyoto Protocol and the associated key categories in the Convention inventory as provided in chapter 5.4.4 of the IPCC good practice guidance for LULUCF. According to this analysis, all activities (afforestation, reforestation, deforestation and forest management) were identified as key categories.

Uncertainties

17. Poland has included detailed information on its uncertainty analysis in annex 6 of its NIR. During the review, the ERT detected some errors in the calculation of N_2O combined uncertainty provided in the NIR. In response to a question raised by the ERT, Poland provided revised uncertainty estimates and updated the relevant tables. The ERT recommends that the Party update the calculation sheets in its next annual submission.

18. Poland plans to improve its uncertainty estimates in two ways. In particular, Poland plans to finalize its tier 2 uncertainty analysis using Monte Carlo simulations. In addition, the Party plans to report more extensively in the NIR on the assumptions and procedures used. The ERT encourages Poland to continue with its planned improvements and to improve the description of uncertainty estimates, especially for the agriculture sector. The ERT noted that uncertainty estimates for KP-LULUCF have not been provided in the 2010 submission. The ERT recommends that Poland conduct an assessment of the uncertainty level of its KP-LULUCF activities in its next annual submission.

19. In the current annual submission, Poland has not used the uncertainty analysis to prioritize improvements in the inventory. The ERT encourages the Party to use this information jointly with a tier 2 key category analysis to plan and prioritize further inventory improvements.

Recalculations and time-series consistency

20. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party of the time series 1988–2007 have been undertaken to take into account the following: changes/improvements in AD (such as the use of only verified EU ETS plant-specific data

[4] The secretariat identified, for each Party, the 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 LULUCF. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

based on actual measurement results in the energy and industrial process sectors, the update of pig iron production for the years 1988–1989, coke production for the years 1988–2007, aluminium production for the year 2007, zinc production for the year 2007, soda ash use for the years 2005–2007, and the update of AD in land-use categories forest land, cropland and grassland); and changes/improvements in EFs (such as the EF for N_2O gasoline from the COPERT IV model for road transportation estimates, the EF for nitric acid N_2O for the years 2005–2007 and the EF for clinker CO_2 for the years 1988–1989) or parameters (such as country-specific nitrogen (N) excretion (Nex) values for animals, country-specific $Frac_{NCR}$ parameters for N-fixing crops and country-specific Nex values for pasture, range and paddocks). The major changes, and the magnitude of the impact, include: a decrease in the estimated total GHG emissions in 1988 (0.07 per cent), a decrease in 1990 (0.22 per cent) and an increase in 2007 (0.6 per cent). The rationale for these recalculations is provided in the NIR but not in CRF table 8(b). The ERT recommends that Poland complete the reporting of CRF table 8(b) in its next annual submission.

21. The ERT noted some time-series inconsistencies due to the use of EU ETS data for the years 2005–2008, especially for iron and steel production in the energy and industrial processes sectors. The ERT recommends that Poland re-examine all the information used, including AD, EFs and the EU ETS data, and make new estimates for both the energy and the industrial processes sectors, while ensuring time-series consistency.

22. The ERT noted that, based on the information included in table summary 3 of the CRF, the data are generally consistent with the NIR, with the following inconsistencies noticed: table summary 3 reports N_2O EFs from agricultural soils as "CS, T1, T1b, T2" while the NIR indicates the use of "CS, T1a, T1b" EFs. For some categories in stationary fuel combustion and LULUCF the consistency could not be assessed because information has not been provided in the NIR. In addition, the ERT noted several inconsistencies in the reporting of data in the CRF tables and in the NIR, especially in the LULUCF sector (see para. 86 below). The ERT recommends that Poland correct the inconsistencies in the next annual submission.

Verification and quality assurance/quality control approaches

23. Poland has included, in its 2010 annual submission, information on its QA/QC procedures and on the national QA/QC plan, in accordance with the IPCC good practice guidance. The QA/QC plan includes a timetable for the annual inventory preparation, the categorizations for tier 1 and tier 2 QC activities and a table listing the allocation of responsibilities for internal QC checks by KOBiZE and external review QA activities by those institutions not directly involved in the preparation of the emission estimates.

24. The NIR provides a limited amount of documentation and discussion on the QA/QC activities implemented at the category level. The ERT reiterates the recommendation of the previous review report that, in its next annual submission, Poland document QA/QC and verification procedures performed under the QA/QC plan for all sectors in more detail in the NIR.

Transparency

25. The structure of the NIR is generally in accordance with 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). However, the ERT noted that the transparency could be improved in the sectoral chapters by: reporting on factors contributing to emission trends and providing explanations for emission trends of the whole time series (e.g. for the energy and waste sectors); reporting additional information on methodologies and on the derivation of EFs for key categories (e.g. for CO_2 from cement production and N_2O from

nitric acid production in the industrial processes sector, or for CH_4 from enteric fermentation and manure management in the agriculture sector); and by providing information on the methodology used to estimate country-specific CO_2 EFs for coal and lignite in the annex of the NIR. The ERT recommends that the Party improve the description of the methodologies, EFs and AD used, especially for plant-specific data, in its next annual submission. In addition, the ERT noted that, for some sectors, like the agriculture sector, the following information is not reported for the individual categories: uncertainty estimates; QA/QC activities; and further improvements planned. The ERT recommends that the Party make use of the annotated outline of the NIR, and the guidance therein, to improve the transparency of the NIR. Moreover, the ERT recommends that the Party improve the transparency of its NIR, by including, in its next annual submission, the responses provided to the ERT during the review.

Inventory management

26. Poland has a centralized archiving system, which includes the archiving of disaggregated EFs and AD, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archive is held by KOBiZE. The archived information also includes internal documentation on QA/QC procedures, external and internal reviews, and documentation on annual key categories, key category identification and planned inventory improvements.

3. Follow-up to previous reviews

27. Poland has implemented some of the recommendations from the previous review report, in particular by: improving the documentation in the NIR with respect to applied EFs, AD and methodologies; improving the consistency between the CRF tables and the NIR; improving the time-series consistency in the energy and agriculture sectors; including the rationale for adopting the uncertainty values reported; updating the description of its national system by providing information on changes; modifying the methodology for using data from installations participating in the EU ETS for the years 2005–2007; and implementing methodological improvements in the agriculture sector using country-specific parameters and EFs for key categories.

4. Areas for further improvement

Identified by the Party

28. The 2010 NIR identifies several areas for improvement:

(a) Further develop the methodology for the incorporation of EU ETS data in the GHG inventory, taking into consideration data consistency in the energy and industrial processes sectors;

(b) Cooperate with the institutions responsible for energy data to improve the explanations of trends of AD in fuel combustion;

(c) Update and verify the data on off-road transportation;

(d) Implement the COPERT IV model to calculate road transportation emissions;

(e) Update the country-specific EFs for fugitive emissions;

(f) Reallocate the CO_2 emissions from fuel use in sinter, pig iron and steel production for the years 1988–2004 from the energy sector to the industrial processes sector to improve the time-series consistency;

(g) Complete the time series for emissions from glass and ceramics production;

(h) Collect detailed information on types of lime produced;

(i) Implement and complete an expert study on N_2O use for anaesthesiology;

(j) Disaggregate animal waste management systems for subcategories of non-dairy cattle and update data on animal waste management systems for swine for the whole time series;

(k) Analyse and use the results of the National Forest Inventory 2005–2009 for emission and removal estimates in the LULUCF sector and for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol;

(l) Develop country-specific parameters and EFs for the first order decay (FOD) landfill emission estimates and extend the time series prior to 1970;

(m) Revise the waste incineration AD for the time series prior to 2001;

(n) Improve the uncertainty estimates by finalizing the analysis based on Monte Carlo simulations and extending the description of assumptions and procedures used.

Identified by the expert review team

29. The ERT identifies the following cross-cutting issues for improvement:

(a) Improve the transparency of the NIR by explaining the changes and the factors contributing to the changes in the time series, the methods, the basic assumptions and the sources of EFs and parameters used;

(b) Include, in the NIR, category-specific uncertainty estimates, QA/QC and verification activities and further planned improvements for all sectors;

(c) Develop country-specific values for EFs and parameters of key category emission estimates;

(d) Complete the reporting of CRF table 8(b) on recalculations;

(e) Complete CRF table 9(a) on categories reported as "NE" and "IE";

(f) Provide a key category tier 2 analysis according to the methodologies provided by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF in future annual submissions;

(g) Improve reporting of all mandatory information items on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol so that the KP-LULUCF reporting is complete and consistent with the requirements of paragraphs 6–9 of the annex to decision 15/CMP.1.

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

B. Energy

1. Sector overview

31. The energy sector is the main sector in the GHG inventory of Poland. In 2008, emissions from the energy sector amounted to 316,957.28 Gg CO_2 eq, or 79.8 per cent of total GHG emissions. Since 1988, emissions have decreased by 32.5 per cent. The key driver for the fall in emissions is the move from a centralized to a market economy in the early 1990s followed by changes to Poland's energy policies, such as the move from carbon-intensive fuels, such as coal, to natural gas and the modernization of industrial production processes. Within the sector, 55.2 per cent of the emissions were from energy

industries, followed by 16.6 per cent from other sectors, 13.9 per cent from transport and 10.3 per cent from manufacturing industries and construction. The remaining 4.0 per cent were from fugitive emissions from the fossil fuel industries, which include solid fuels, oil and natural gas.

32. Poland has implemented changes to its reporting and improvements to the inventory to increase the accuracy, transparency, completeness and comparability, as recommended by the ERT in the 2009 review report. For example, improvements include: using only verified EU ETS plant-specific data based on actual measurement results; using the EF for N_2O gasoline for passenger cars with catalysts, based on information from the COPERT IV model; reallocating GHG emissions associated with pipeline operations and maintenance from energy industries to transport; reallocating the emissions from coking gas in coking plants and metal production from the energy to the industrial processes sector; and revising the notation keys for fugitive emissions from solid fuel transformation and for the reference approach tables.

33. Explanations provided by the Party during the review and the energy data tables provided in annex 2 of the NIR contributed to an increase in the transparency of the information presented in the NIR, in particular for factors contributing to large fluctuations of emissions for the petroleum refining industry, pipeline transport, and the commercial/institutional and residential categories; data sources for the energy sector; and the changing shares due to economic factors or policy implications. The ERT recommends that Poland increase the transparency of the NIR of its next annual submission by elaborating on factors contributing to the changes in fuel consumption, fuel switching, emission trends, EFs and other parameters.

34. Emissions information reported for several categories does not follow the UNFCCC reporting guidelines, which would ensure time-series consistency and/or accurate IPCC category allocation. For example, 2008 emissions from petroleum refining are reported in public electricity and heat production instead of petroleum refining, process emissions from iron and steel from 1988 to 2004 are reported in manufacturing industries and construction instead of industrial processes – metal production, and both the use of EU ETS EFs from 2005 onwards for industrial sources, and the use of International Energy Agency (IEA) and Eurostat data where fuel consumption values are not aligned (such as jet fuel – aviation bunker) contributed to inter-annual changes in implied emission factors (IEFs). The ERT recognizes Poland's efforts in trying to resolve these issues and recommends that Poland report consistently following the UNFCCC reporting guidelines.

2. Reference and sectoral approaches

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

35. Poland has not reported fuel values in physical units in CRF table 1.A(b) for production, imports, exports, international bunkers, stock changes and conversion factors and has instead used notation keys. In response to questions raised by the ERT during the review, Poland explained that this is due to the fact that these data are available only in energy units (TJ) and that the CRF Reporter software allows only mass units to be reported, except for apparent consumption. However, the ERT noted that for the 2008 data, the information is given in TJ in the NIR to increase the transparency of the inventory. To further ensure completeness, comparability and to increase the transparency of the reported information, the ERT recommends that Poland report all relevant data in table 1.A(b) of the CRF by converting the energy values to a mass- or volume-based value using energy conversion factors (i.e. unit of energy by weight or volume per unit of energy in TJ), which should be available from the energy statistics agency responsible for the compilation of the energy balance.

36. In general, the difference between the reference and sectoral approach is ranging from –2.00 to 2.00 per cent for most years while the difference is 3.64 per cent and 4.16 per cent in 1988 and in 2008, respectively. Poland states in the NIR that these differences are a result of comparing a top-down approach, which does not take into account how fuels are consumed by each sector, with a bottom-up approach. To ensure comparability of results between the reference and sectoral approaches the ERT recommends that Poland provide, in its NIR and in CRF table 1.A(c), explanations regarding the factors contributing to a difference greater than 2 per cent.

37. A portion of the natural gas consumed by the refining industry has been subtracted from the gaseous category of the reference approach and this volume is then reallocated to the liquid fuel category as crude oil. In its response to the ERT during the review, Poland indicated that the purpose of this adjustment was to ensure a balance of total available carbon in the refining stream and that a detailed explanation would be provided in its next annual submission. The ERT noted that this approach is not consistent with that of the Revised 1996 IPCC Guidelines; furthermore, this approach has implications for comparability with respect to the AD and applied crude oil carbon conversion factors (if the impact of natural gas is not taken in account). The purpose of the reference approach is to take stock of all available carbon (excluding the portion that is stored in products) for comparison with the overall results from the sectoral approach. The ERT recommends that Poland report total natural gas consumed in the natural gas line of the reference approach table in the CRF tables in order to ensure comparability and consistency with the UNFCCC reporting guidelines and the Revised 1996 IPCC Guidelines.

International bunker fuels

38. Poland has assumed that 95 per cent of total jet fuel consumed is for international aviation. This approach to the split of aviation fuel is not consistent with that of the IPCC good practice guidance. The ERT reiterates the recommendation from the previous review report that Poland apply the IPCC good practice guidance in order to ensure that emissions from international aviation are neither systematically overestimated nor underestimated for the whole time series. Also, the ERT encourages Poland to collect information on scheduled flights from the national aviation authorities and the European Organization for the Safety of Air Navigation, along with other international organizations, in order to develop a methodology to split domestic and international aviation bunker fuels as already developed for marine bunkers.

Feedstocks and non-energy use of fuels

39. From 2005 onwards, Poland has reported emissions associated with the use of feedstocks from iron ore sinter production, blast furnaces, basic oxygen furnaces and electric arc furnaces in industrial processes – metal production, based on information reported to the EU ETS, whereas for the years before, these emissions are reported in manufacturing industries and construction. The NIR states that Poland is now focused on addressing the time-series inconsistency from 1988 to 2004 in order to report emissions in industrial processes – metal production for the whole time series. The ERT appreciated Poland's efforts to ensure the alignment of reported information and strongly recommends that Poland implement improvements in time for its next annual submission and provide, in the NIR, a discussion of the methodology used to estimate and reallocate feedstock-related emissions from 1988 to 2004, which will also increase the transparency of the information presented in the NIR.

3. Key categories

Stationary combustion: all fuels – CO_2

40. The Party has used a combination of IPCC tier 2 and 3 approaches along with IPCC default, country-specific and plant-specific (EU ETS) EFs to estimate CO_2 emissions from stationary combustion. Stationary combustion accounts for approximately 82.0 per cent of emissions from the energy sector and country-specific EFs are only available for hard coal and lignite. The ERT recommends that Poland develop country-specific CO_2 EFs for all fuels in order to increase the accuracy of the CO_2 emissions from the energy sector, because this is a significant contributor to Poland's overall GHG emissions. The ERT notes that, if Poland considers the usage of EFs from the EU ETS to be appropriate, then before applying the new EFs to the entire time series, Poland must ensure that the new EFs were developed based on a fuel-quality measurement approach which is consistent with the tier 3 approach from the Revised 1996 IPCC Guidelines.

41. Country-specific CO_2 EFs for hard coal and lignite have been derived by Poland in order to estimate emissions from the combustion of these fuels. Information provided during the review helped to increase the understanding, applicability and quality of derived factors. The ERT reiterates the recommendation from the previous review report that Poland provide, as a separate annex to the NIR, a discussion on the development of the empirical equations for hard coal and for lignite in terms of their relationship with the net calorific value and with carbon content, along with a comparison of existing data in order to support this improvement and increase the transparency of the NIR.

42. Refinery fuel gas consumption and emissions for 2008 were reported in public electricity and heat production. During the review, Poland indicated that this information will be reported in its next annual submission in the category petroleum refining in order to ensure time-series consistency and comparability.

Road transportation – CO_2

43. In section 3.4.2 and table 3.4.1 of the NIR, Poland has reported that the applied CO_2 EF for diesel oil in road transportation is 73.16 kg/GJ. Based on the information reported in CRF table 1.A.(a) (May 2010 submission) the CO_2 IEFs for 2007 and 2008 are 67.74 kg/GJ and 68.43 kg/GJ, respectively, which results in an inconsistent time series and a possible underestimation of emissions. In response to questions raised by the ERT, Poland indicated during the review that the EFs reported in the CRF tables were incorrect, and Poland resubmitted its CRF tables with the revised estimates, including a consistent IEF, over the time series using the EF value 73.16 kg/GJ.

44. As a general principle, the CO_2 EFs from the combustion of gasoline for transportation vehicles with or without catalytic technology should be identical (unless a different oxidation factor has been applied). Poland's CO_2 EF for gasoline without catalytic technology (70.75 kg/GJ) is higher than that with catalytic technology (70.31 kg/GJ) for both passenger cars and light-duty vehicles. The ERT reiterates the recommendation from the 2009 review report that Poland develop a CO_2 EF for gasoline based on the carbon content of the fuel in order to increase the accuracy of its emission estimates.

4. Non-key categories

Road transportation – N_2O

45. The N_2O EF with catalyst and without catalyst control is reported as 0.004 kg/GJ in table 3.4.1 of the NIR for all road transportation diesel vehicles. As a general principle, different catalytic control technology will result in a range of N_2O EFs. The ERT

recommends that Poland reassess the use of a constant N_2O EF for diesel vehicles in order to ensure that the emission estimates are accurate.

Civil aviation and navigation: aviation gasoline and diesel oil – all gases

46. The ERT encourages Poland to implement the improvements noted by the Party in the NIR with respect to the large volume of energy consumed and resulting emissions from the combustion of aviation gasoline for civil aviation in 1991 and diesel oil for navigation in 1990 in order to ensure time-series consistency and improve the accuracy of its inventory estimates.

Coal mining and handling: solid fuels – CH_4

47. Fugitive CH_4 emissions from surface mining – post-mining activities are reported as "NE". During the review, in response to questions raised by the ERT, Poland indicated that CH_4 emissions from post-mining activities are estimated directly based on a nationally derived EF at an aggregated level. The ERT also noted that the notation key "NE" is reported for fugitive CH_4 recovered or flared and for all fugitive CO_2 emissions in the coal mining and handling category. The ERT encourages Poland to report fugitive emissions from solid fuel production and post-mining operation in its next annual submission to ensure completeness and to include a discussion of the methodology, AD and EFs. In addition, the ERT recommends that Poland disaggregate emissions to the appropriate subcategories. If this is not possible, the notation key "IE" should be used and an explanation as to their allocation should be provided to increase the transparency of the CRF tables and of the NIR.

C. Industrial processes and solvent and other product use

1. Sector overview

48. In 2008, emissions from the industrial processes sector amounted to 33,322.39 Gg CO_2 eq, or 8.4 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 742.04 Gg CO_2 eq, or 0.2 per cent of total GHG emissions. Since the base year, emissions have increased by 2.2 per cent in the industrial processes sector and decreased by 26.3 per cent in the solvent and other product use sector. The trend in emissions in the industrial processes sector shows a decrease in emissions from the chemical industry, metal production and mineral products and a significant increase in emissions from consumption of halocarbons and SF_6. Within the industrial processes sector, 30.3 per cent of the emissions were from metal production, followed by 29.7 per cent from mineral products, 25.7 per cent from the chemical industry and 11.1 per cent from consumption of halocarbons and SF_6. The remaining 3.2 per cent were from other industrial processes.

49. The CRF tables include estimates of all gases and categories of emissions from the industrial processes and the solvent and other product use sectors, as recommended by the Revised 1996 IPCC Guidelines. CO_2 emissions from other (mineral products) and from other (industrial processes) are reported only from 2005 onwards; for 1988–2004 the notation keys "NA" and "NO" are reported. The ERT noted that the NIR does not provide an explanation that these activities did not occur or did not generate emissions before 2005. The ERT recommends that Poland calculate emissions for the entire times series or provide sufficient explanation in the NIR as to why emissions are not estimated and change the reported notation keys, if appropriate.

50. Potential emissions of F-gases for all years are not reported. During the review, Poland informed the ERT that it plans to introduce the estimates of the potential emissions

in its next annual submission. The ERT welcomes this planned improvement and encourages the Party to proceed with these plans to improve completeness.

51. Poland has addressed a number of the issues raised in the 2009 review report. However, the ERT noted that, for some categories, the NIR provides limited information on the methods, AD and EFs used to estimate emissions. The ERT recommends that the Party include detailed descriptions of the methodologies, EFs and AD used, especially those that are plant-specific, in the NIR in its next annual submission.

52. The ERT noted that recalculations reported by the Party were undertaken due to changes in EFs (nitric acid production for the years 2005–2007, clinker production for the years 1988–1989) and updated AD (pig iron for the years 1988–1989, coke production for the years 1988–2007, aluminium production for the year 2007, zinc production for the year 2007, soda ash use for the years 2005–2007). Recalculations lowered total GHG emissions in the industrial processes sector by 387.78 Gg CO_2 eq or 1.2 per cent in 2007, and by 678.85 Gg CO_2 eq or 2.0 per cent in the base year. The rationale for recalculations is provided in the NIR but not in CRF table 8(b). The ERT recommends that the Party fully explain and document recalculations for the entire time series in its next annual submission.

53. The inclusion of the full set of EU ETS data in the inventory for the years 2005–2008 has led to time-series inconsistencies in the inventory, due to differences in the methodologies used in estimating emissions between the IPCC good practice guidance and the EU ETS. The ERT reiterates the recommendation from the previous review report that the Party only use the EU ETS data when it is consistent with the UNFCCC reporting guidelines and the IPCC good practice guidance and ensure time-series consistency.

54. The ERT noted that the sector-specific QA/QC activities are not sufficiently described in the NIR. The ERT recommends that Poland improve the description of QA/QC activities for the industrial processes sector in the NIR in its next annual submission.

2. Key categories

Cement production – CO_2

55. The Party reported process CO_2 emissions based on plant-specific data from the EU ETS reports for the years 2005–2008. For the rest of the time series, two types of EFs have been used to estimate CO_2 emissions: for 1988–2000 the average of 2001–2004 country-specific EFs (0.529 t CO_2/t clinker); and for 2001–2004 country-specific EFs (0.527–0.531 t CO_2/t clinker). The ERT noted that, in the NIR, there is no information on how EFs for 2001–2004 were derived and how emissions for 2005–2008 from the EU ETS were calculated. The ERT recommends that the Party fully document in the NIR the methodologies, AD and EFs used for calculations in its next annual submission and explain how the time-series consistency is ensured.

Nitric acid production – N_2O

56. For the years 1988–2004, the Party has used a single country-specific EF (6.47 kg/Mg nitric acid) according to a national study covering all nitric acid production plants. During the review, the ERT was informed that for the years 2005–2008, N_2O emissions were estimated based on plant-specific data from all nitric acid producers. These data were gathered for the purpose of estimating the amount of allowance for the period 2013–2020 under the EU ETS. However, the ERT notes that the NIR still does not include sufficient information on the methodology used and AD, as well as on the existing abatement technologies. With regard to this, the ERT reiterates the recommendation from the previous review report that the Party provide, in the NIR in its next annual submission,

a more detailed description of the methods and AD used and explain how the time-series consistency is ensured.

Iron and steel production – CO_2

57. For the years 1988–2004, CO_2 emissions are estimated according to the IPCC good practice guidance. For pig iron, coke and steel production an appropriate carbon mass balance was applied. The emissions from energy use of fuels are reported in the energy sector, thus avoiding double counting.

58. For the years 2005–2008, CO_2 emissions are estimated using data from the EU ETS verified reports. These are common data covering both the process and the combustion (energy use) CO_2 emissions. For these years, the combustion emissions are also reported within the industrial processes sector, while the corresponding amount of fuel is subtracted from the energy sector. However, this reallocation of emissions from the energy sector to the industrial processes sector has led to significant inconsistencies in the whole time series for the years 1988–2008. The ERT reiterates the recommendation from the previous review report that the Party re-examine all the information used, including AD, EFs and the EU ETS data, and make new estimates for both the energy and the industrial processes sectors, while ensuring time-series consistency. In particular, this recommendation is also still valid for the emission estimates from pig iron production in blast furnaces.

59. In response to questions concerning coke production raised by the ERT during the review, the Party provided adequate information to explain how any potential double counting is avoided. The ERT recommends that Poland include this information in its next annual submission.

3. Non-key categories

Limestone and dolomite use – CO_2

60. As previous review reports have already noted, Poland reported, under limestone and dolomite use, only the CO_2 emissions from sulphur removal installations for environmental pollution control in the power plants that participate in the EU ETS for the years 2005–2008. The rest of the emissions are reported separately under other categories in the industrial processes sector, as follows: mineral industry (glass production and ceramics production) and metal production (iron ore sinter production, pig iron and steel production, steel cast production). The ERT reiterates the recommendation from the previous review report that Poland estimate the total amount of all limestone and dolomite used and related CO_2 emissions for the whole times series in this category.

Other (mineral products) – CO_2

61. Poland reported CO_2 emissions from other (mineral products) including emissions from glass and ceramics production only for the years 2005–2008, using data from the EU ETS verified reports from the largest installations. In response to questions raised during the review, Poland explained that AD for the years 1988–2004 are difficult to collect due to the wide range of products and disaggregation of this category. The ERT reiterates the recommendation from the previous review report that Poland estimate related CO_2 emissions for the entire time series.

D. Agriculture

1. Sector overview

62. In 2008, emissions from the agriculture sector amounted to 37,113.08 Gg CO_2 eq, or 9.4 per cent of total GHG emissions. Since the base year, emissions have decreased by 28.4 per cent. The key drivers for this decrease in emissions was a reduction of livestock, especially cattle, sheep and swine, and decreasing consumption of synthetic fertilizers caused by economic recession in the early 1990s. After 2005, emissions slightly increased again, mainly due to the stabilization of market drivers of agricultural production caused by Poland's accession to the European Union. Within the sector, 51.7 per cent of the emissions were from agricultural soil, followed by 25.2 per cent from enteric fermentation and 23.0 per cent from manure management. The remaining 0.1 per cent were from field burning of agricultural residues.

63. Poland estimated all required gases and categories in its CRF tables for 2008 as recommended by the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. Poland has used the notation key "NE" to report several parameters and gases (non-methane volatile organic compounds) in its CRF tables for 2008. Poland has used the notation key "NA" to report CH_4 emissions from direct soil emissions and indirect emissions, due to the lack of EFs and methodology. Poland has used the notation key "IE" to report N_2O emissions from pulses and included these emissions in the category other (field burning of agricultural residues) by integrating pulses for food with pulses for feeding animals.

64. The ERT welcomes the improvements in the completeness and transparency made by Poland in the NIR since the last submission, following the recommendations of the previous review report. However, the level of detail and completeness of the information reported in the NIR is still not sufficient. The structure of the agriculture chapter of the NIR is not fully in line with the UNFCCC reporting guidelines, as the following information for the individual subcategories is not reported: uncertainty estimates; QA/QC activities; and improvements planned. The ERT recommends that Poland increase the completeness by providing these elements and increase transparency by providing explanatory information to justify the national EFs and the methodologies used for key categories within the sector.

65. The ERT welcomes the recalculations performed by Poland for its 2010 submission, based on the recommendations of the previous review report. The recalculations lead to an increase of total emissions from agriculture in the base year (1.2 per cent) and in 2007 (6.0 per cent). The ERT noted that the recalculations generally improved the inventory, for example: the use of country-specific N-excretion values for animals; improvements in the country-specific $Frac_{NCR}$ parameter for N-fixing crops; the area of histosols; the introduction of country-specific N-excretion values for pasture, range and paddocks; and the reporting of N_2O emissions from sewage sludge used in agriculture. However, the ERT noted that the revised EFs and methods and their impact on time-series consistency and the emission trend were not sufficiently documented and therefore recommends that Poland include these elements in its next annual submission.

66. Poland used higher-tier methods for some key categories in the sector but not always with sufficient accuracy. The ERT noted that recalculations of N_2O emissions from agricultural soils – especially in synthetic fertilizers, manure applied to soil and crop residues – were performed; the ERT noted that these changes did not improve the emission inventory because country-specific EFs have been substituted with IPCC default EFs moving from a higher tier to a lower one without detailing the rationale. The ERT encourages Poland to improve the accuracy in this respect and explore country-specific information for estimating the emissions of key categories. The ERT also recommends that

Poland provide more detailed information on uncertainties of the AD and EFs which are used in its uncertainty analysis in the agriculture chapter.

67. The ERT noted that sector-specific QA/QC procedures in the agriculture sector are not reported comprehensively and are not fully in line with the IPCC good practice guidance in terms of category-specific QC procedures (tier 2) and QA review procedures. The ERT encourages Poland to implement the necessary steps for improving QA/QC activities at each level of AD collection, EF estimation and emission estimation by sectoral experts. The ERT reiterates the recommendation of the previous review report that the Party document QA/QC activities and identify further improvements in more detail in the NIR. The ERT noted that several recommendations from the previous annual review report were not implemented by Poland (e.g. harmonization of the time series for the population of young non-dairy cattle, explaining driving forces for unusual changes in the trends for the different AD) and reiterates these recommendations.

2. Key categories

Enteric fermentation – CH_4

68. Poland used a tier 2 methodology and country-specific EFs for dairy cattle, non-dairy cattle and sheep to estimate CH_4 emissions from enteric fermentation. The Party used a tier 1 methodology and default EFs to estimate CH_4 emissions for goats, horses and swine. The ERT noted that the methods used are in line with the IPCC good practice guidance and comparable with methods used in other developed countries and welcomes the increase in accuracy by using country-specific methods and parameters for all significant animal categories.

69. The CH_4 IEF for dairy cattle (96.57 kg/head/year) and the CH_4 IEF for non-dairy cattle (47.92 kg/head/year) in 2008 are unusually low in comparison with the values used in tier 2 estimations of other developed countries. During the review, Poland provided explanations for the CH_4 IEF (dairy cattle) estimation and statistical information on milk production and gross energy intake, which are lower than in other comparable countries. Poland also provided further background information to support the CH_4 IEF (non-dairy cattle) and explained that the low value is the result of including young cattle in this subcategory. The ERT recommends that Poland increase the transparency of its reporting by describing young cattle separately in the next NIR.

70. The ERT welcomes the effort made by Poland to improve the consistency of animal numbers for non-dairy cattle. Poland used data from the Central Statistical Office and from the National Research Institute of Animal Production to harmonize the time series, but the inconsistencies, especially for young cattle, still occurred even in this reference database, mostly between the 1988–1997 and the 1998–2008 time series. The ERT recommends that Poland explain the methodological differences between both institutions in more detail and use the Central Statistical Office as the main source of AD for the whole time series in the future, in order to ensure time-series consistency.

Manure management – CH_4 and N_2O

71. Poland identifies CH_4 emissions from swine as the most significant source of CH_4 emissions in manure management, accounting for 64.5 per cent of these emissions in 2008. Poland estimated CH_4 emissions using the tier 2 methodology and country-specific EFs for cattle, sheep and swine, which is in line with the IPCC good practice guidance. To improve the transparency of its reporting in the NIR, the ERT recommends that Poland document the country-specific data used for estimating the emissions of significant animal categories providing a better description of its animal waste management systems.

72. The ERT noted an increase of CH_4 emissions from dairy cattle, by 10 per cent between 2006 and 2007, and inconsistencies in the trend between enteric fermentation and manure management emissions of dairy cattle since 2002. During the review, Poland explained that the unusual trend of CH_4 emissions occurred in manure management of dairy cattle and is caused by a significant increase in the share of liquid systems in animal waste management systems. The reported data for animal waste management systems for 2002–2006 is the mean value assessed for this period and is significantly higher than for the previous years. The ERT recommends that Poland include these explanations regarding the unusual trends in its next NIR.

73. Poland identifies solid storage and dry lot as the major source of N_2O emissions among all manure management systems in the country, accounting for 77 per cent of these emissions, and swine as the most significant animal category. The ERT welcomes the efforts made by Poland in estimating country-specific Nex values for all animal categories based on national publications following the recommendations of the previous review report.

Direct soil emissions – N_2O

74. The ERT welcomes the improvement in completeness in this category since the last submission, by including N_2O emissions from sewage sludge.

75. The ERT noted that, after a significant decrease in the use of synthetic fertilizers in the early 1990s, the use of synthetic fertilizers has increased again since 2005. The trend is unusual, because it is contrary to the trend in other developed countries and does not correlate with the trend of plant production that is decreasing. The ERT encourages Poland to discuss this issue at the national level and to include an explanation for this trend in its next NIR.

76. Poland followed the recommendations from previous review reports and used country-specific parameters (tier 1b) for crop residue and N-fixing crops and corrected the statistics for the area of histosols. However, the ERT noted that the description in the NIR is not transparent and complete, because it does not include sufficient background data about the methodologies and country-specific values that have been used for the estimation of N_2O emissions from crop residues and N-fixing crops. The ERT recommends that Poland include this information in its next annual submission. The ERT also encourages Poland to disaggregate N-fixing crops to specific species (peas, bean, soybean) as the basis for its emission estimates and to include a description of the weighted mean values of $Frac_{NCRO}$ and $Frac_{NCRBF}$ in its next NIR.

Indirect soil emissions – N_2O

77. The ERT welcomes Poland's efforts to improve transparency in the reporting of indirect N_2O emissions following the recommendations of the previous review report by including sewage sludge in its formula for estimating emissions from N leaching and runoff in line with the IPCC good practice guidance. The ERT encourages Poland to make further steps to improve its estimates using country-specific EFs for N leaching and runoff.

3. Non-key categories

Field burning of agricultural residues – CH_4 and N_2O

78. The ERT welcomes the increased consistency between the reporting of direct soil emissions and emissions from field burning of agricultural residues, which has been achieved by using consistent sources of AD. The ERT commends Poland for using country-specific parameters for estimating emissions from this non-key category.

E. Land use, land-use change and forestry

1. Sector overview

79. In 2008, the LULUCF sector was a net sink of 39,163.91 Gg CO_2 eq. Since the base year, net removals have increased by 111.8 per cent. The key driver for the rise in removals is a growth in living biomass in forest land, which represents a net sink of 52,364.90 Gg CO_2 eq, while other removals occur in settlements, accounting for 76.88 Gg CO_2 eq. Cropland is the major source of emissions, accounting for 7,834.54 Gg CO_2 eq, followed by 5,300.14 Gg CO_2 eq from wetlands and grassland accounted for 143.18 Gg CO_2 eq.

80. The ERT noted that the representation of land remains problematic. The sum of land-use categories in CRF tables 5.A to 5.F estimated by the ERT shows that the balance of total country area is very different to the total stated in NIR table 7.2. In the CRF tables (submitted in May 2010) the total area of the country varies from a minimum of 20,193.6 kha in 1990 and a maximum of 20,938.6 kha in 2001, while in the NIR the total area of Poland is reported as 31,269.0 kha. During the review, Poland reported several amendments on various land-use categories, mainly cropland. The ERT recommends that the Party revise the area values of all land-use categories reported in the NIR and in the CRF tables, and verify that they correspond. The ERT also recommends that Poland report subcategories that include set-aside land and different management intensity, as recommended by the IPCC good practice guidance for LULUCF, in order to ensure the consistent representation of land areas.

81. Poland indicates in the NIR, as in previous annual submissions, that estimates from fires in forest land, cropland and grassland are provided and that the appropriate methodology was used to estimate non-CO_2 emissions, but no AD were provided in the NIR or CRF tables. Furthermore, Poland does not differentiate between fires in cropland and in grassland, which may have distinct biomass volume values. This applies for the entire time series. During the review, Poland submitted AD for the area burned in 2008 in forest land, grassland and wetlands, along with CO_2, CH_4 and N_2O EFs for forest land and CH_4 and N_2O EFs for grassland and wetlands. Since the Party has demonstrated that it has information on biomass burning, the ERT recommends that it provide the AD and EFs for the entire time series and for each land-use category in its next annual submission.

82. The CRF tables include estimates of emissions and removals for most gases and categories from the LULUCF sector. The ERT noted that carbon stock changes and non-CO_2 emissions in some subcategories have been reported as "NE" as follows: settlements and wetlands converted to cropland; forest land converted to grassland; grassland converted to wetlands; drainage of forest soils; disturbance associated with land-use conversion to cropland; and biomass burning in forest land. The ERT recommends that Poland estimate and report all mandatory categories currently reported as "NE" in its next annual submission.

83. In NIR tables 7.7, 7.10 and 7.11, the Party states that country-specific rates for soil organic carbon stock were applied. The ERT noted that the NIR did not include references to the sources of information for these country-specific factors. During the review, Poland provided this information. The ERT recommends that Poland include these sources of information and more detailed explanations on the calculation of the country-specific soil organic carbon rates in its next annual submission.

84. In the NIR, Poland reports uncertainties of 19.1 per cent for CO_2, 98.4 per cent for CH_4 and 63.6 per cent for N_2O in the LULUCF sector in 2008, stating that a simplified approach was applied based only on emissions data, due to the lack of information on activities. The ERT recommends that Poland increase the transparency of the assessment of

uncertainties in the LULUCF sector by providing more detailed information on the assumptions and the calculation process.

85. The NIR reports that recalculations were made on the EFs and AD in forest land, grassland and cropland, but no explanation is provided in the NIR or the CRF tables. The ERT recommends that Poland provide these explanations to increase transparency in its next annual submission. The recalculations lead to a decrease in total removals from the sector in the base year (–37.2 per cent) and an increase in 2007 (5.3 per cent).

86. The ERT also noted several inconsistencies between the NIR and the CRF tables; for example, for emissions, areas and total values of carbon stock changes. Sector-specific information on QA/QC is briefly mentioned for the LULUCF sector in the NIR. The ERT recommends that Poland strengthen the QC procedures in this sector and report on these in its next annual submission.

2. Key categories

Forest land remaining forest land – CO_2

87. Poland reports a constant value of 0.36 Mg C/ha for the net carbon stock change in mineral soils for the complete time series, which is one of the highest among all reporting Parties (0.00–0.82 Mg C/ha). During the review, Poland explained that the country-specific value was derived by expert judgement from national research on "Carbon balance for the main forest species in Poland". The ERT recommends that Poland provide the sources of information used for deriving the country-specific value in its next annual submission.

Land converted to forest land – CO_2

88. The NIR provides very little information on this category and does not include values for the parameters needed to estimate the annual change in carbon stocks in living biomass, mineral and organic soils. Poland does not include information on areas of land converted to intensively or extensively managed forests and does not provide the values for the annual growth rate of biomass for these subcategories. The ERT strongly recommends that Poland provide this information in the NIR in its next annual submission.

Cropland remaining cropland – CO_2

89. In CRF table 5.B, the net carbon stock change in living biomass in 2004 was 5.31 Mg C/ha and in 2005 was 16.50 Mg C/ha, which means that the value in 2005 is 211.0 per cent higher than in 2004. Likewise, the net carbon stock change in 2006 was 3.80 Mg C/ha which means that the value in 2006 is 77.0 per cent lower than in 2005. The ERT noted that these values show unusual fluctuations. During the review, Poland explained that the wrong values were used. The ERT recommends that Poland check the EFs and correct these mistakes in its next annual submission.

3. Non-key categories

Land converted to grassland – CO_2

90. In the NIR (chapter 7.4.1.2), Poland indicates that the carbon stock change in living biomass for land converted to grassland was not estimated, because in Poland only cropland without perennial woody biomass is converted to this category. Since grassland is a mandatory reporting category, the ERT considers that the Party could use IPCC default values for non-woody biomass, such as those contained in table 3.4.9 of the IPCC good practice guidance for LULUCF. During the review, Poland explained that this issue will be reviewed. The ERT recommends that the Party calculate the carbon stock change in

biomass for land converted to grassland and describe the calculations in the NIR in its next annual submission.

Settlements remaining settlements – CO_2

91. The ERT noted that the area of settlements decreased by 54.5 per cent between 1989 and 1990. The net carbon stock change in living biomass for 1988 and 1989 was reported as "IE", "NA" and "NO", while for the rest of the years increasing values were reported. Similarly, the net carbon stock change in soils was 797.9 Gg C in 1988 and 852.8 Gg C in 1989, while the notation key "NA" was applied for the remaining years of the time series. The ERT recommends that Poland assure time-series consistency by revising the information on carbon stock changes, and report thereon in the NIR and CRF tables in its next annual submission.

Other land remaining other land

92. In CRF table 5.F, the area of other land remaining other land is reported as "NA" for the years 1988 and 1989, while for the remaining years of the time series area values were reported. The ERT recommends that Poland provide all the area data for the complete time series in this land-use category in its next annual submission.

F. Waste

1. Sector overview

93. In 2008, emissions from the waste sector amounted to 8,911.3 Gg CO_2 eq, or 2.2 per cent of total national GHG emissions. Since 1988, emissions have decreased by 4.9 per cent, mainly due to the fall of emissions in wastewater handling and waste incineration that outweighed the increase of emissions from solid waste disposal. Within the sector, 73.0 per cent of the emissions were from solid waste disposal on land, while wastewater handling and waste incineration accounted for 24.3 and 2.7 per cent, respectively. CH_4 is the dominant gas, accounting for 85.0 per cent of the emissions from this sector, followed by 12.4 per cent for N_2O and 2.6 per cent for CO_2.

94. Poland's NIR lacks transparency, but the Party has provided comprehensive answers to all the questions raised by the ERT during the review. The ERT recommends that the Party improve the transparency of its NIR by including the responses it provided to the ERT during the review and by explaining the trends. The Party reported incorrect data for total waste generation for the years 2006–2008. In response to a question raised by the ERT, Poland explained that CH_4 emissions were calculated on the basis of waste going to solid waste disposal sites and that these values are taken directly from the statistical yearbook and therefore the emissions were calculated correctly. The ERT recommends that Poland correct these errors in its next annual submission and implement sector-specific QC procedures in order to avoid such errors in the future.

2. Key categories

Solid waste disposal on land – CH_4

95. CH_4 emissions from solid waste disposal on land accounted for 73.0 per cent of total GHG emissions in the waste sector. Poland used the tier 2 methodology of the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) for estimating emissions for managed, unmanaged and industrial waste disposal on land and all default parameters were taken directly from the IPCC waste model. In the NIR, Poland states that it does not have sufficient background data to develop a

country-specific value for the methane generation rate (k) and therefore uses default values. Also, the Party has used default degradable organic carbon (DOC) values for different types of waste, because there are no national studies on DOC. The AD are provided by the Central Statistical Office and by research. The ERT recommends that Poland use country-specific information on the composition of municipal solid waste and industrial waste to derive country-specific DOC data in order to estimate CH_4 emissions from this category. Industrial waste is calculated for the period 1975–2008; however, the NIR does not provide transparent information on the type of industrial waste being landfilled or on the trend. The ERT recommends that Poland provide this information in its next annual submission.

3. Non-key categories

Wastewater handling – CH_4 and N_2O

96. CH_4 emissions from industrial, domestic and commercial wastewater were estimated based on the methodology provided in the Revised 1996 IPCC Guidelines. CH_4 emissions from domestic and commercial wastewater accounted for 81.7 per cent of total CH_4 emissions from this category and 18.3 per cent from industrial wastewater. The CH_4 IEF for industrial wastewater has decreased from 0.043 kg/kg degradable organic component (DC) in 1988 to 0.026 kg/kg DC in 2008 and this is explained by the annual changes of the average EF varying on the basis of the wastewater production distribution of the different industries. EFs are obtained by expert judgement based on research of wastewater treatment by wastewater treatment plants. To improve transparency, the ERT encourages Poland to provide additional information on the methodologies and country-specific parameters used in the NIR of its next annual submission.

97. The ERT noted that N_2O emissions from industrial, domestic and commercial wastewater are reported as "NA" and "NO" and that N_2O emissions from humane sewage are estimated. The ERT encourages the Party to explore whether N_2O emissions from the wastewater subcategories are included in the N_2O emissions from human sewage and if so, to change the notation keys accordingly. The ERT also encourages Poland to estimate all N_2O emissions from wastewater which are not included elsewhere and to report them in its next annual submission.

Waste incineration – CH_4

98. The ERT noted that the notation key "NO" was reported for CH_4 emissions from waste incineration. As this activity occurs in the country, the ERT recommends that the Party estimate the emissions or change the notation key to "NA".

G. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

1. Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Overview

99. Poland has elected to account for forest management as land-use activities under Article 3, paragraph 4, of the Kyoto Protocol, for the first commitment period. The Party has chosen to account for activities under Article 3, paragraphs 3 and 4, at the end of the commitment period. Poland has reported the CRF tables – KP-LULUCF tables, as required by decision 15/CMP.1. In October 2010, Poland resubmitted a complete set of KP-LULUCF tables, which included several corrections to the original KP-LULUCF submission that was under review by the ERT.

100. In the NIR, Poland states that the land-use transition matrix is based on a land-use change identification system developed for reporting purposes under the Kyoto Protocol. This system permits a detailed spatial assessment and identification of afforestation and deforestation activities at the level of the individual cadastral units. Nevertheless, no numerical matrix for afforestation, reforestation and deforestation is presented in the NIR. Furthermore, in NIR figure 10.3 forest management activities are indicated in the form of a graph, and no numerical data are provided. During the review, Poland provided appropriate information on AD for forest management, afforestation, reforestation and deforestation. The ERT recommends that the Party report this information in the NIR in its next annual submission.

101. In the NIR, Poland states that the KP-LULUCF reporting is based on annually updated administrative data and maps from the National Record of Lands and Buildings, and digital maps and data from the Polish State Forest Holding, among others. The ERT noted that no examples of maps were provided in the NIR. During the review, Poland submitted some cartographical examples for forest management activities. The ERT recommends that Poland display this information in the NIR in the next annual submission.

102. The ERT noted some inconsistencies in area values in table NIR-2, where the area value for afforestation and reforestation should be the same as that resulting from the sum of the areas from tables 5(KP-I)A.1.1 and 5(KP-I)A.1.2, and the area value for forest management should be the same as in table 5(KP-I)B.1. Likewise, the total area at the beginning of the current inventory year in the last column of table NIR-2 should be equal to the country total area. Finally, in the column "other" the area value should be the difference between the country total area and the area of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. During the review, Poland corrected the above inconsistencies, but the ERT noted that some of them still remained; for example, the country total area and forest management area. The ERT strongly recommends that Poland revise and reconcile the area values in its KP-LULUCF tables in its next annual submission.

103. In the NIR, Poland states that the reported emissions for biomass burning are in accordance with reports on wildfires, and that it is not possible to assign wildfires to land subjected to afforestation, reforestation and deforestation and forest management activities reported under the Kyoto Protocol. During the review, the Party provided information on AD and IEFs for wildfires in forest management. The ERT strongly recommends that Poland make efforts to identify wildfires in afforestation, reforestation and deforestation and forest management areas, in order to improve completeness in its next annual submission.

104. The NIR states that uncertainty estimates for KP-LULUCF are not available for the 2010 submission. The ERT recommends that Poland make an effort to conduct an assessment of the uncertainty level for its KP-LULUCF activities in its next annual submission.

105. The ERT noted that Poland has not accounted for emissions in the carbon pools litter and dead wood in the corresponding KP-LULUCF tables for afforestation, reforestation and deforestation and forest management. According to its NIR, the Party has assumed that the carbon stock change in dead organic matter equals zero. During the review, Poland indicated that the carbon stock change in litter and dead wood is assumed to be zero, consistent with the tier 1 approach in the IPCC good practice guidance for LULUCF, although it is developing a system for the estimation of carbon stock changes in the dead wood pool as part of the National Forest Inventory and for the litter pool, as part of an in-country research study. The ERT recommends that Poland estimate emissions from all pools or provide verifiable information that any unaccounted pool is not a net source of anthropogenic GHG emissions in accordance with paragraph 6(e) of the annex to decision 15/CMP.1. The information provided by Poland in its 2010 submission did not account for

the soil pool in the units of land subject to activities under Article 3, paragraph 3, of the Kyoto Protocol, for units of land not harvested since the beginning of the commitment period, and for the soil pool in the lands subject to forest management activities. During the review, Poland provided data for soil carbon stock changes in the lands previously mentioned, although it did not mention the sources of this information. The ERT recommends that Poland provide this missing information in its next annual submission.

Activities under Article 3, paragraph 3, of the Kyoto Protocol

Afforestation and reforestation – CO_2

106. The ERT noted that Poland reported all information on afforestation and reforestation on units of land harvested since the beginning of the commitment period as "NO", but no explanation is provided in the NIR or in the documentation box in the CRF tables. The ERT recommends that Poland provide information in a transparent manner on this issue in its next annual submission.

Deforestation – CO_2

107. The ERT noted that in KP-LULUCF table 5(KP-I)A.2 the area of deforestation amounts to 0.62 kha, while in the LULUCF CRF tables 5.B to 5.F no forest land is reported to be converted to other land-use categories. In the CRF tables that were resubmitted during the review, Poland reported 0.62 kha of forest land converted to settlements, solving the problem. The ERT encourages Poland to ensure that the data in its LULUCF reporting under the Convention and under the Kyoto Protocol are correctly reconciled in its next submission.

Activities under Article 3, paragraph 4, of the Kyoto Protocol

Forest management – CO_2

108. The ERT noted that no information was provided in the NIR to demonstrate that forest management activities under Article 3, paragraph 4, of the Kyoto Protocol are not accounted for under activities under Article 3, paragraph 3. The ERT recommends that Poland provide this specific information in accordance with paragraph 9(c) of the annex to decision 15/CMP.1 in its next annual submission.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

109. Poland has reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. The ERT took note of the findings and recommendations included in the SIAR on the SEF tables and the SEF comparison report.[5] The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the main findings and recommendations contained in the SIAR.

110. Information on the accounting of Kyoto units has been prepared and reported in accordance with chapter I.E of the annex to decision 15/CMP.1, and reported in accordance with decision 14/CMP.1 using the SEF tables. This information is consistent with that contained in the national registry and with the records of the international transaction log

[5] The SEF comparison report is prepared by the ITL administrator and provides information on the outcome of the comparison of data contained in the Party's SEF tables with corresponding records contained in the ITL.

(ITL) and the clean development mechanism registry and meets the requirements set out in paragraph 88 (a–j) of the annex to decision 22/CMP.1. The transactions of Kyoto Protocol units initiated by the national registry are in accordance with the requirements of the annex to decision 5/CMP.1 and the annex to decision 13/CMP.1. No non-replacement has occurred.

111. Information reported by the Party on records of any discrepancies and on any records of non-replacement was found to be consistent with information provided to the secretariat by the ITL. However, the ERT noted from the SIAR that Poland did not provide, in its annual submission, information on actions undertaken to correct any problem that caused a discrepancy to occur and to prevent it from reoccurring, in accordance with paragraph 17 of the annex to decision 13/CMP.1. During the SIAR review, Poland reported on planned changes to the national registry to prevent any discrepancy from reoccurring by implementing a new functionality minimizing the occurrence of discrepancies in the middle of 2010. The ERT reiterates the recommendation from the previous review report and from the SIAR that Poland report, in its next annual submission, the actions taken to correct any problem that caused a discrepancy to occur or any changes to the national registry to prevent a discrepancy from reoccurring in accordance with paragraph 17 of the annex to decision 13/CMP.1.

National registry

112. The ERT took note of the SIAR and its finding that the reported information on the national registry is complete and has been submitted in accordance with the annex to decision 15/CMP.1. The ERT further noted from the SIAR and its finding that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1. The national registry also has adequate security, data safeguard and disaster recovery measures in place.

Calculation of the commitment period reserve

113. Poland reported its commitment period reserve in its 2010 annual submission to equal 1,994,527,271 t CO_2 eq, based on the latest reviewed inventory (398,905.45 Gg CO_2 eq). The ERT disagrees with this figure. In response to questions raised by the ERT during the review, Poland revised the estimates in its most recently reviewed inventory (2008) to be 397,046.06 Gg CO_2 eq and reported its calculation of the commitment period reserve to be 1,985,230,315 t CO_2 eq, based on the national emissions in its most recently reviewed inventory (397,046.06 Gg CO_2 eq). The ERT agrees with this figure.

3. Changes to the national system

114. Poland provided information on changes to its national system since the previous annual submission concerning the arrangements put in place in 2009 which included legislation to ensure that Poland complies with the international commitments on air emissions and will allow for cost-effective reductions of GHG emissions. The "Act on the System to manage GHG emissions" established KOBiZE and assigns to it specified working areas including, among others, the management of the emissions database, the development of methodologies to estimate emissions and the management of the national registry. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

4. Changes to the national registry

115. Poland reported that there is no change in its national registry since the previous annual submission. The ERT concluded that the Party's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP).

5. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

116. Poland has reported information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as requested in chapter I.H of the annex to decision 15/CMP.1, in its 2010 annual submission.

117. The reported information is considered complete and transparent. Poland reported that coal is the main source of energy used for electricity and heat production in the country and that this fuel will also be prevalent in the future. Nevertheless, Poland plans to apply low-emission technologies, that is, clean coal technologies (CCT), including the production of liquid and gaseous fuels from coal, instead of depleting world resources of crude oil. The Party is funding research activities with the aim to develop an EU-leading research centre on CCT. Actions aimed at the minimization of adverse impacts have been developed with the EU, such as the EU legislation to introduce a scheme of generalized tariff preferences (known as the EU Generalised System of Preferences system). According to this legislation, developing countries that want to access this system should ratify and implement international conventions, including the Kyoto Protocol. Furthermore, Poland reported on bilateral projects regarding technology transfer for energy-saving plans and the development of renewable energy sources in agriculture.

III. Conclusions and recommendations

118. Poland made its annual submission on 15 April 2010. The annual submission contains the GHG inventory (comprising CRF tables and an NIR). Poland resubmitted its CRF tables and KP-LULUCF CRF tables on 26 May 2010 and its NIR that contained supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on 27 May 2010, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry, and the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. This is generally in line with decision 15/CMP.1.

119. The ERT concludes that the inventory submission of Poland has been prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is complete and the Party has submitted a complete set of CRF tables for the years 1990–2008 and an NIR; these are complete in terms of geographical coverage, years and sectors. Some of the categories were reported as "NE", particularly in the LULUCF sector (carbon stock changes and non-CO_2 emissions in settlements and wetlands converted to cropland, forest land converted to grassland, grassland converted to wetlands, drainage of forest soils, disturbance associated with land-use conversion to cropland, and biomass burning in forest land).

120. The submission of information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1.

121. The Party's inventory is in line with the UNFCCC reporting guidelines, and generally in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The ERT identified some deviations from the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, including: some inconsistencies in the representation of land use; the use of a tier 1 method for some key categories; and a lack of consistency in the time series when EU ETS data are used to estimate emissions since 2005, such as for the iron and steel industry (both for energy and industrial processes emissions).

122. The ERT concluded that Poland's submission on its KP-LULUCF activities is generally in accordance with the requirements of paragraphs 5–9 of the annex to decision 15/CMP.1. The ERT noted that Poland did not account for carbon stock changes in dead organic matter and litter and did not report verifiable information demonstrating that these carbon stock changes are not a net source of anthropogenic GHG emissions and also noted that, during the review, Poland provided additional information on these matters and stated that research activities are under way to calculate the amount of these emissions and removals.

123. Poland has reported information on its accounting of Kyoto Protocol units in accordance with chapter I.E of the annex to decision 15/CMP.1, and used the required reporting format tables as required by decision 14/CMP.1.

124. The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1.

125. The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions.

126. Poland has reported the information requested in chapter I.H of the annex to decision 15/CMP.1, "Minimization of adverse impacts in accordance with Article 3, paragraph 14" as part of its 2010 annual submission. The information was provided on 15 April 2010. The information provided on the minimization of adverse impacts is considered complete and transparent.

127. In the course of the review, the ERT formulated a number of recommendations relating to the transparency and completeness of the annual submission (including information required under Article 7, paragraph 1, of the Kyoto Protocol) and the accuracy of the estimates of the information presented in Poland's annual submission. The key recommendations are that Poland:

(a) Further improve the transparency of the NIR, explaining the changes and the factors contributing to the changes in the time series, the methods, the basic assumptions and the sources of EFs and parameters used;

(b) Include in the NIR category-specific uncertainty estimates, QA/QC and verification activities, and further planned improvements for all sectors;

(c) Further improve the completeness of its inventory by providing estimates for all categories, even if not mandatory, giving priority to the missing categories especially in the LULUCF sector for which the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF provide estimation methodologies;

(d) Provide a key category tier 2 analysis according to the methodologies provided by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF in the next annual submissions;

(e) Ensure the consistency of the complete time series for emissions from iron and steel production, in both the energy and industrial processes sectors, when EU ETS data since 2005 have been used;

(f) Develop country-specific values for CO_2 emissions from fuels other than coal in the energy sector, and for parameters of the FOD model to estimate CH_4 emissions from landfills;

(g) Complete the reporting of CRF table 8(b) on recalculations;

(h) Complete CRF table 9(a) on categories reported as "NE" and "IE";

(i) Further enhance the completeness of all mandatory information items on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

IV. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/SBSTA/2006/9. Available at <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

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

"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf# page=14>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

Status report for Poland 2010. Available at <http://unfccc.int/resource/docs/2008/asr/pol.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2010. Available at <http://unfccc.int/resource/webdocs/sai/2010.pdf>.

FCCC/ARR/2009/POL. Report of the individual review of the greenhouse gas inventory of Poland submitted in 2009. Available at <http://unfccc.int/resource/docs/2010/arr/pol.pdf>.

UNFCCC. *Standard Independent Assessment Report*, Parts I and II. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Anna Olecka (KOBiZE, Institute of Environmental Protection, National Centre for Emission Management), including additional material on the methodologies and assumptions used and calculation sheets. The following documents[1] were also provided by Poland:

Poland. 2006. *The2010 National Waste Management Plan.* Warsaw.

Jadwiga Bernacka, Leoniłła Pawłowska, Iwona Kargulewicz. 2005. *Opracowanie i analiza danych dotyczących emisji gazów cieplarnianych z gospodarki ściekami komunalnymi* (gaseous emission analysis from the management of urban solid waste), Warszawa..

Loboda T., Pietkiewicz S. 1994. *Estimation of methane, carbon monoxide, nitrous oxide and nitrogen oxides released to atmosphere from agriculture residues burning in 1992*. Warsaw Agriculture University. Warszawa (in Polish).

Glowny Urzad Statistyczny. CSO, Agriculture and Food Economy Division. 2009. *Agriculture in 2008*. Warszawa. Available at <http://www.stat.gov.pl>.

[1] Reproduced as received from the Party.

Annex II

Acronyms and abbreviations

AD	activity data
CCT	clean coal technologies
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
DC	degradable organic component
DOC	degradable organic carbon
EF	emission factor
ERT	expert review team
EU	European Union
EU ETS	European Union emissions trading scheme
FOD	first order decay
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)
HFCs	hydrofluorocarbons
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1,000 grams)
KP-LULUCF	land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
Mg	megagram (1 Mg = 1 tonne)
N	nitrogen
NA	not applicable
NE	not estimated
NO	not occurring
N_2O	nitrous oxide
NIR	national inventory report
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change