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Report on the individual review of the annual submission of Greece submitted in 2014*

* In the symbol for this document, 2014 refers to the year in which the inventory was submitted, and not to the year of publication.

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Contents

I. Introduction and summary

1. This report covers the review of the 2014 annual submission of Greece, coordinated by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1) (hereinafter referred to as the Article 8 review guidelines). The review took place from 15 to 20 September 2014 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Justin Goodwin (United Kingdom of Great Britain and Northern Ireland), Mr. Michael Gytarsky (Russian Federation) and Ms. Jolanta Merkeliene (Lithuania); energy – Mr. Ralph Harthan (Germany), Ms. Tahira Munir (Pakistan) and Mr. Jongikhaya Witi (South Africa); industrial processes and solvent and other product use – Ms. Nouf Aburas (Saudi Arabia) and Mr. Ole-Kenneth Nielsen (Denmark); agriculture – Ms. Hongmin Dong (China) and Mr. Kazumasa Kawashima (Japan); land use, land-use change and forestry (LULUCF) – Mr. Kevin Black (Ireland), Mr. Raehyun Kim (Republic of Korea) and Mr. Vladimir Korotkov (Russian Federation); and waste – Mr. Seungdo Kim (Republic of Korea) and Mr Gabor Kis-Kovacs (Hungary). Mr Goodwin and Mr. Witi were the lead reviewers. The review was coordinated by Mr. Matthew Dudley (UNFCCC secretariat).

2. In accordance with the Article 8 review guidelines, a draft version of this report was sent to the Government of Greece, which provided comments that were considered and incorporated, as appropriate, into this final version of the report. All encouragements and recommendations in this report are for the next annual submission, unless otherwise specified.

3. All recommendations and encouragements included in this report are based on the expert review team's (ERT's) assessment of the 2014 annual submission against the Article 8 review guidelines. The ERT has not taken into account the fact that Parties will prepare the submissions due by 15 April 2015 using the revised guidelines "Guidelines for the preparation of national communications by Parties include in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories" (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines) adopted through decision 24/CP.19. Therefore, when preparing the 2015 annual submissions, Parties should evaluate the implementation of the recommendations and encouragements in this report, in the context of those guidelines.

4. In 2012, the main greenhouse gas (GHG) emitted by Greece was carbon dioxide (CO_2), accounting for 81.5 per cent of total GHG emissions[1] expressed in CO_2 equivalent (CO_2 eq), followed by methane (CH_4) (8.7 per cent) and nitrous oxide (N_2O) (6.1 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 3.6 per cent of the overall GHG emissions in the country. The energy sector accounted for 78.6 per cent of total GHG emissions, followed by the industrial processes sector (8.7 per cent), the agriculture sector (8.2 per cent), the waste sector (4.3 per cent) and the solvent and other product use sector (0.3 per cent). Total GHG emissions amounted to 110,994.06 Gg CO_2 eq and increased by 3.6 per cent between the

[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.

base year[2] and 2012. The ERT concluded that the description in the national inventory report (NIR) of the trends for the different gases and sectors is reasonable.

5. Tables 1 and 2 show GHG emissions from sources included in Annex A to the Kyoto Protocol (hereinafter referred to as 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, elected activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector and activity, respectively.

6. Information to be included in the compilation and accounting database can be found in annex I to this report.

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from sources included in Annex A to the Kyoto Protocol 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[a] to 2012

			Gg CO_2 eq								*Change (%)*
		Greenhouse gas	*Base year*	*1990*	*1995*	*2008*	*2009*	*2010*	*2011*	*2012*	*Base year –2012*
Annex A sources		CO_2	82 997.81	82 997.81	86 441.72	110 005.38	103 712.60	96 758.27	94 250.73	90 472.39	9.0
		CH_4	10 610.99	10 610.99	10 865.64	10 064.99	9 797.43	9 899.12	9 783.96	9 706.24	–8.5
		N_2O	10 225.23	10 225.23	9 071.30	7 645.89	7 191.22	7 513.37	7 208.94	6 810.88	–33.4
		HFCs	3 290.41	935.06	3 290.41	2 950.25	3 338.70	3 603.28	3 410.13	3 889.05	18.2
		PFCs	53.97	163.37	53.97	93.53	74.28	105.55	78.34	110.39	104.5
		SF_6	3.59	3.07	3.59	7.53	5.26	6.14	5.15	5.11	42.6
KP-LULUCF	Article 3.3[b]	CO_2				–56.14	–82.39	–121.83	–98.09	–44.28	
		CH_4				0.17	0.19	0.08	0.03	0.13	
		N_2O				0.02	0.02	0.01	0.01	0.02	
	Article 3.4[c]	CO_2	NA			–1 744.36	–1 735.64	–1 796.32	–1 821.90	–1 770.21	NA
		CH_4	NA			17.11	18.66	7.92	3.39	12.54	NA
		N_2O	NA			1.74	1.89	0.80	0.34	1.27	NA

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, 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.

[a] The base year for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2012

			Gg CO_2 eq								*Change (%)*
		Sector	*Base year*	*1990*	*1995*	*2008*	*2009*	*2010*	*2011*	*2012*	*Base year–2012*
Annex A sources		Energy	76 726.07	76 726.07	80 579.00	104 208.36	99 727.20	92 496.99	91 677.50	87 257.74	13.7
		Industrial processes	12 851.95	10 605.49	12 396.38	11 885.40	10 248.68	10 591.29	8 720.81	9 606.76	–25.3
		Solvent and other product use	308.34	308.34	299.82	314.13	315.60	316.17	316.41	318.47	3.3
		Agriculture	11 407.60	11 407.60	10 369.59	9 350.46	9 069.75	9 433.40	9 137.12	9 075.85	–20.4
		Waste	5 888.03	5 888.03	6 081.84	5 009.21	4 758.26	5 047.86	4 885.43	4 735.23	–19.6
		LULUCF	NA	–2 114.28	–2 887.27	–2 849.12	–2 681.05	–2 854.54	–2 931.11	–2 865.55	NA
		Total (with LULUCF)	**NA**	**102 821.25**	**106 839.36**	**127 918.44**	**121 438.43**	**115 031.18**	**111 806.15**	**108 128.51**	**NA**
		Total (without LULUCF)	**107 181.99**	**104 935.53**	**109 726.64**	**130 767.57**	**124 119.48**	**117 885.72**	**114 737.26**	**110 994.06**	**3.6**
		Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
KP-LULUCF	Article 3.3[c]	Afforestation and reforestation				–108.57	–130.13	–165.61	–143.70	–144.39	
		Deforestation				52.63	47.95	43.87	45.66	100.26	
		Total (3.3)				**–55.94**	**–82.18**	**–121.73**	**–98.05**	**–44.13**	
	Article 3.4[d]	Forest management				–1 725.51	–1 715.09	–1 787.60	–1 818.17	–1 756.40	
		Cropland management	NA			NA	NA	NA	NA	NA	NA
		Grazing land management	NA			NA	NA	NA	NA	NA	NA
		Revegetation	NA			NA	NA	NA	NA	NA	NA
		Total (3.4)	**NA**			**–1 725.51**	**–1 715.09**	**–1 787.60**	**–1 818.17**	**–1 756.40**	**NA**

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] The base year for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6.The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 7) are not included in Annex A to the Kyoto Protocol and are therefore not included in national totals.

[c] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

[d] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

7. The 2014 annual submission was submitted on 15 April 2014; it contains a complete set of common reporting format (CRF) tables for the period 1990–2012 and an NIR. Greece also submitted the 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 the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 15 April 2014.

8. Greece submitted revised CRF tables on 19 September 2014 in response to questions raised by the ERT during the review (see paras. 37, 39, 66, 75, 88 and 92 below). The values used in this report are those submitted by Greece on 19 September 2014.

9. The list of other materials used during the review is provided in annex II to this report.

2. Questions of implementation raised in the 2013 annual review report

10. The ERT noted that no questions of implementation have been raised in the 2013 annual review report.

3. Overall assessment of the inventory

11. Table 3 contains the ERT's overall assessment of the annual submission of Greece. For recommendations for improvements for specific categories, please see the paragraphs cross-referenced in the table.

Table 3
The expert review team's overall assessment of the annual submission

Issue	*Expert review team assessment*	*General findings and recommendations*
The ERT's findings on completeness		
Annex A sources[a]	Complete	Mandatory: None
		Non-mandatory: CO_2 emissions from asphalt roofing and road paving with asphalt; direct and indirect CH_4 emissions from agricultural soils; and potential emissions of HFCs, PFCs and SF_6
		The ERT encourages the Party to estimate and report emissions from the non-mandatory categories
Land use, land-use change and forestry[a]	Not complete	Mandatory:: carbon stock change in mineral soil for cropland remaining cropland and cropland converted to forest land; carbon stock change in living biomass of cropland converted to settlements; areas of lands and carbon stock

Issue	*Expert review team assessment*	*General findings and recommendations*
		change in living biomass and dead organic matter pools of grassland converted to forest land (see paras. 67 and 70 below for category-specific findings) The ERT recommends that Greece estimate and report emissions from all mandatory categories
		Non-mandatory: carbon stock change in living biomass for wetlands remaining wetlands and settlements remaining settlements; CH_4 and N_2O emissions from lands converted to wetlands The ERT encourages the Party to estimate and report emissions from all non-mandatory categories
KP-LULUCF	Complete	
The ERT's findings on recalculations and time-series consistency		
Transparency of recalculations	Sufficiently transparent	
Time-series consistency	Sufficiently consistent	
The ERT's findings on QA/QC procedures	Not sufficient	Although Greece has implemented QA/QC procedures in accordance with the QA/QC plan referred to in the NIR, the ERT identified mistakes and inconsistencies in the NIR and CRF tables for multiple sectors. The ERT reiterates the recommendation made in the previous review report that the Party strengthen the QA/QC procedures Please see paragraphs 50, 78 and 79 below for category-specific recommendations
The ERT's findings on transparency	Not sufficiently transparent	The ERT reiterates the recommendation made in the previous review report that Greece provide the information on the AD and EFs actually used in the GHG calculations (e.g. in the energy, agriculture, LULUCF and waste sectors) Please see paragraphs 16, 37, 38, 48, 55, 62, 67 and 68 below for category-specific recommendations

Abbreviations: AD = activity data, Annex A sources = source categories included in Annex A to the Kyoto Protocol, CRF = common reporting format, EFs = emission factors, ERT = expert review team, GHG = greenhouse gas, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NE = not estimated, NIR = national inventory report, QA/QC = quality assurance/quality control.

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty*

Management in National Greenhouse Gas Inventories or the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*).

12. The ERT noted that Greece strives to implement the recommendations of the previous review reports. Section 9.4 of the NIR includes an overview on how the recommendations of the previous review reports have been addressed and the recalculations made in response to the previous review recommendations. The ERT commends the Party for the improvements made. However, the ERT further noted that not all the recommendations made in the previous review report have been addressed in the 2014 inventory submission. The ERT recommends that Greece undertake additional efforts to fully address those recommendations that have not yet been fulfilled.

13. The ERT noted that Greece has improved the use of notation keys in response to recommendations made in the previous review report. The ERT commends the Party for the improvements made. However, the use of notation keys still needs to be enhanced in the CRF tables for the energy sector (see para. 27 below). The ERT reiterates the recommendation made in the previous review report that the Party enhance the use of notation keys in the CRF tables.

14. The previous review report recommended that Greece strengthen the quality control (QC) procedures to ensure consistency of the data in the NIR and the CRF tables and improve the explanations provided in the documentation boxes. The ERT noted differences in the information on tiers and emission factors (EFs) used for the GHG calculation between table 1.1 of the NIR and the CRF summary table 3 (e.g. in CRF summary table 3 the notation key "NA" (not applicable) is used for the method for CH_4 and the description of the EF for chemical industry, while for the same category, in table 1.1 of the NIR, T1 and "NA" are used for the method and "D" (default) and "NA" is used for the EF). Similar differences were noted for the transport category in the energy sector. The ERT reiterates the recommendation made in the previous review report that Greece enhance its quality assurance/quality control (QA/QC) checks to identify and correct errors with a view to improve the consistency between the NIR and the CRF tables (for examples see paras. 45, 50, 78 and 79 below).

15. The reference to the QA/QC plan was provided in section 1.6 of the NIR, but the QA/QC plan was not included. The ERT noted that the timeline for specific QA/QC procedures was not provided in the NIR. The ERT recommends that Greece include the QA/QC plan in the next inventory submission and provide the timeline for the implementation of the sector-specific and general QA/QC procedures.

16. The ERT noted that there is a need to improve the transparency of the submission in the NIR, especially regarding the industrial processes, agriculture, LULUCF and waste sectors (see paras. 48, 55, 62, 67, 80 and 93 below, respectively). The ERT also noted that the information on methods, activity data (AD) and parameters in the NIR and the CRF tables is not sufficient for the ERT to follow the calculations performed for: charcoal production and use; oil and natural gas; consumption of halocarbons; enteric fermentation; manure management; agricultural soils; LULUCF; and wastewater handling (see paras. 37, 39, 40, 47, 59, 61–62 and 80 below). Furthermore, the ERT noted that for energy industries and for manufacturing industries and construction Greece used default EFs under tier 2 methods, without sufficient justification in the NIR. The ERT recommends that the Party enhance the transparency of its reporting by providing additional information on AD and parameters used in the inventory. The ERT also recommends that the Party justify the use of default EFs under tier 2 methods for energy industries and for manufacturing industries and construction.

17. The ERT noted that Greece has used the tier 1 method to estimate emissions from key categories in the subsectors fugitive emissions from fuel (CH_4 from lignite mining),

enteric fermentation (CH_4 emissions from goats; see para. 57 below) and manure management (N_2O emissions). In response to a question raised by the ERT during the review, the Party provided a justification for its use of the tier 1 method to estimate CH_4 from lignite mining, and explained that it will explore developing higher tier methods for categories in the agriculture sector identified as key for the first time. The ERT recommends that Greece derive country-specific parameters and use higher tier methods for the key categories in the agriculture sector.

18. The ERT noted that Greece has not provided an inventory improvement plan, although it has been referred to in the NIR. In response to a question raised by the ERT during the review, the Party explained that the improvement plan was the aggregation of the improvement plans described in the appropriate sections of the sector chapters of the NIR. In the view of the ERT, the provision of an inventory improvement plan for the entire inventory would provide a better overview of the Party's priorities as well as the allocation of resources and time for their implementation. The ERT therefore encourages Greece to develop an inventory improvement plan for the entire inventory and provide a timeline for the implementation of improvements therein.

4. Description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Inventory planning

19. The NIR and additional information provided by the Party during the review (e.g. Circular 918/21-4-08) contributed to a complete description of the national system for the preparation of the inventory. In response to a question raised by the ERT during the review, the Party responded that there were no changes to the inventory planning process. The description of the inventory planning process, as contained in the report of the individual review of the annual submission of Greece submitted in 2013,[3] remains relevant.

Inventory preparation

20. Table 4 contains the ERT's assessment of Greece's inventory preparation process. For improvements related to specific categories, please see the paragraphs cross-referenced in the table.

Table 4
Assessment of inventory preparation by Greece

Issue	*Expert review team assessment*	*ERT findings and recommendations*
Key category analysis		
Was the key category analysis performed in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	
Approach followed?	Tier 1	
Were additional key categories identified using a qualitative approach?	No	

[3] FCCC/ARR/2013/GRC, paragraphs 9–12.

Issue	*Expert review team assessment*	*ERT findings and recommendations*
Has the Party identified key categories 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 UNFCCC inventory?	Yes	Forest management was identified as a key category
Does the Party use the key category analysis to prioritize inventory improvements?	Yes	
Assessment of uncertainty analysis		
Approach followed?	Tier 1	
Was the uncertainty analysis carried out in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	Yes	
Quantitative uncertainty (including LULUCF)	Level = 9.9% Trend = 10.2%	
Quantitative uncertainty (excluding LULUCF)	Level = 9.7% Trend = 10.0%	

Abbreviations: IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, LULUCF = land use, land-use change and forestry.

Inventory management

21. Greece has a centralized archiving system, maintained by the Ministry of Environment, Energy and Climate Change (MEECC), which includes the archiving of EFs and AD disaggregated by sector and submission year, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory (referred to as the "input data file"). MEECC also archives the centralized inventory file, which includes all information received from data providers, input data files, calculation sheets and related documentation. The centralized inventory file also includes the information on the inventory team, the electronic and hard copies of the previous review reports and CRF tables, uncertainty estimation files and review reports, comments from the public reviews, the documentation on QA/QC procedures, annual key categories and key category identification and planned inventory improvements.

5. Follow-up to previous reviews

22. The ERT noted that in its 2014 annual submission Greece has addressed the recommendations made in the 2012 and 2013 annual review reports. Greece also provided an overview of ongoing and planned actions and improvements initiated due to the

recommendations made in previous review reports. The improvements carried out by the Party in the 2014 annual submission include:

(a) The improvement of time-series consistency for the estimation of CO_2 emissions from cement production;

(b) The provision of additional information on methods and data used for the estimation of the potential emissions from imported foam products;

(c) The recalculation the CH_4 emissions from dairy and non-dairy cattle based on country-specific values for the methane conversion factor (MCF) and feed digestibility;

(d) The enhancement of the description of the method used to derive the animal waste management system (AWMS) fractions;

(e) The provision of complete annual land-use change matrices and the explanation of how these were developed;

(f) The verification of the results of the estimates of carbon stock changes for forest land remaining forest land with the use of the Intergovernmental Panel on Climate Change (IPCC) gain and loss method (see para. 73 below);

(g) The provision of emission estimates from categories in the LULUCF sector not estimated in previous annual submissions (namely, carbon stock changes in mineral soils in grassland converted to cropland, settlements, other land; carbon stock changes in dead organic matter and mineral soils in grassland converted to wetlands; N_2O emissions from disturbance associated with land-use conversion to cropland; and carbon stock changes in living biomass in cropland converted to grassland);

(h) Enhanced accuracy and consistency of the data and other information for the waste sector in the NIR and CRF tables (see paras. 79 and 80 below).

23. Recommendations from previous review reports that have not yet been implemented, as well as issues the ERT identified during the 2014 annual review, are discussed in the relevant sector chapters of the report and in table 9 below.

B. Energy

1. Sector overview

24. The energy sector is the main sector in the GHG inventory of Greece. In 2012, emissions from the energy sector amounted to 87,257.74 Gg CO_2 eq, or 78.6 per cent of total GHG emissions. Since 1990, emissions have increased by 13.7 per cent. The key driver for the rise in emissions is the general economic growth; more specifically, the growth of the service sector and improvements in living standards. However, since 2008 emissions have been showing a declining trend due to the introduction of energy efficiency measures and renewable energy sources, the economic crisis and the increased share of natural gas in the electricity production system. Within the sector, 62.7 per cent of the emissions were from energy industries, followed by 18.4 per cent from transport, 10.8 per cent from other sectors and 6.3 per cent from manufacturing industries and construction. The remaining 1.8 per cent were from fugitive emissions from fuels.

25. Greece has made recalculations between the 2013 and 2014 annual submissions for this sector. The most significant recalculations made by Greece between the 2013 and 2014 annual submissions were in transport and manufacturing industries and construction (emissions decreased by 0.6 per cent for 1990). The recalculations were made following changes in AD and EFs and in order to rectify identified errors. Compared with the 2013

annual submission, recalculations decreased emissions for 2011 in the energy sector by 496.88 Gg CO_2 eq (0.5 per cent). The recalculation was adequately explained in the NIR. However, the ERT notes that in its NIR Greece estimated the recalculations associated with the transport subsector to be 2.2 per cent even though the ERT estimated the value to be 2.5 per cent.

26. The NIR (page 99) indicates that cross-checking between energy consumption data derived from national energy balance tables and plant-specific energy consumption data of major plants derived from verified reports by the European Union Emissions Trading System (EU ETS) is performed. In response to a question raised by the ERT during the review week on how EU ETS data are used to improve the uncertainty analysis data, Greece explained that the uncertainty values for AD and CO_2 EFs of stationary combustion used in the uncertainty analysis were reduced from 5 per cent to 3 per cent. The ERT notes these improvements in the uncertainty estimates for stationary combustion but recommends that Greece transparently describe in the NIR how the quantification of uncertainty estimates associated with AD and CO_2 EFs for stationary combustion is derived from EU ETS data.

27. The ERT observed that, for pipeline transport, CRF table 1.A reported natural gas consumption of 199.8 TJ for 2012 while the NIR (page 440) reported 0 TJ consumption. Similarly, CO_2 and CH_4 emissions from oil transport were reported as "NA" in CRF table 1.B.2. In response to a question raised by the ERT during the review, Greece explained that the correct notation key is "IE" (included elsewhere) and these emissions have been allocated under venting (under the category venting and flaring for oil and natural gas). Greece further provided evidence that these emissions were indeed estimated. The ERT agrees with the evidence that Greece provided and recommends that Greece report these emissions separately under oil transport.

2. Reference and sectoral approaches

28. Table 5 provides a review of the information reported under the reference approach and the sectoral approach, as well as comparisons with other sources of international data. Issues identified in table 5 are more fully elaborated in paragraphs 29–31 below.

Table 5
Review of reference and sectoral approaches

Issue	*Expert review team assessment*	*Paragraph cross-references*
Difference between the reference approach and the sectoral approach	Energy consumption: –3.75 PJ, –0.39% CO_2 emissions: 265.65 Gg CO_2, 0.31%	
Are differences between the reference approach and the sectoral approach adequately explained in the NIR and the CRF tables?	Yes	29
Are differences with international statistics adequately explained?	Yes	
Is reporting of bunker fuels in accordance with the UNFCCC reporting guidelines?	Yes	
Is reporting of feedstocks and non-energy use of fuels in accordance with the UNFCCC reporting guidelines?	No	31

Abbreviations: CRF = common reporting format, NIR = national inventory report, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

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

29. The ERT observed that crude oil production reported in CRF table 1Ab is 12 per cent higher for all years from 1991 to 2012, except for 2005 and 2006 (which are both 26 per cent higher), compared with data reported to the International Energy Agency (IEA). This difference is attributed to the lower net calorific values (NCVs) reported to the IEA. The ERT noted that the 2005 and 2006 differences cannot be completely explained by NCV differences. In response to a question raised by the ERT during the review, Greece explained that for 2005 and 2006 it reported crude oil amounts in mass units (kt) that were 11 per cent lower compared with amounts reported in the CRF tables and that the error will be corrected in the next submission. The ERT notes the response by the Party and recommends that the Party harmonize all data sets used for international reporting.

International bunker fuels

30. No problems were identified.

Feedstocks and non-energy use of fuels

31. In the 2014 submission, Greece managed to reallocate from the energy sector (chemicals) the CO_2 emissions associated with the use of lignite as feedstock to ammonia production and report them under ammonia production. However, the ERT noted that Greece has not followed a recommendation from the previous review report to reallocate from the energy sector liquid fuels that were used as feedstock in ammonia production to the industrial processes sector. The ERT recommends that Greece implement this reallocation of emissions and transparently document the impact of this reallocation in the relevant categories as well as in the comparison between the reference and sectoral approaches in its submission.

3. Key categories

Civil aviation: liquid fuels – CO_2

32. The NIR (page 123) states that Greece is making efforts to collect data on aircraft fleet composition but major difficulties are still being experienced in applying a more detailed methodology for CO_2, CH_4 and N_2O (e.g. the Party has estimated these emissions in the 2014 submission using a tier 2a method). In response to a question raised by the ERT during the review week, Greece explained that the Hellenic Aviation Agency might possibly provide information on these activities but not for all the years in the time series and that data from EUROCONTROL has been used in the 2014 submission for the first time to improve the accuracy of the estimates. The ERT is of the view that a bottom-up emission estimation approach taking into account aircraft type and flight details will significantly improve the accuracy of CO_2 emissions from civil aviation and ensure that the split between civil aviation and aviation bunkers is informed by a bottom-up methodological approach as opposed to only the energy balances. The ERT encourages Greece to engage with the Hellenic Aviation Agency to start a process of collecting data on aircraft types and flight details and to report thereon in its submission.

Road transportation: liquid, gaseous fuels and biomass – CO_2

33. The ERT observed that Greece performs a comparison of fuel consumption associated with road transport that is estimated using the COPERT model[4] with fuel

[4] See <http://www.emisia.com/copert/>.

consumption data from the energy balances. The NIR does not transparently describe the results of the comparison. The ERT noted that this makes it difficult to assess the accuracy of CO_2 emission estimates from road transport. In response to a question raised by the ERT, Greece explained that the comparison between the two fuel consumption datasets results in differences particularly for the year 2007 mostly for liquefied petroleum gas (LPG) and diesel consumption which may be connected to the illegal uses of fuels and lack of accuracy in the energy balance data, especially for LPG. The Party further explained that because of these differences and the fact that fuel consumption is directly connected to the number of kilometres driven, the Party adjusts the yearly number of kilometres travelled in order to achieve the coherency required with national energy balance data. The ERT notes that this approach ensures that CH_4 and N_2O emissions reported in the inventory (obtained from the COPERT model) are not underestimated. However, the response from the Party also indicates that there may be inaccuracies with statistical data on fuel consumption, particularly for LPG and diesel, for the reasons explained above. Hence, the ERT reiterates the recommendation from the previous review report that Greece put measures in place to reduce statistical errors in the fuel data and improve the accuracy of LPG consumption in the energy balance. The ERT further recommends that Greece present in tabular format a comparison of the results of fuel consumption calculations showing those results estimated using the COPERT model and the energy balance in its submission.

34. During the review week, the ERT asked for further information from Greece about the allocation of emissions from ground activities at airports. Greece responded that fuel consumption and data on the vehicle fleet involved in ground activities at airports and harbours are included in the vehicle fleet data used in the COPERT model and in the energy balance and reported under road transportation. However, the ERT notes that these emissions should be reported under other transportation and that the availability of vehicle fleet data for these activities should enable Greece to estimate and report these emissions separately under other transportation. The ERT recommends that the Party reallocate these emissions from road transportation to other transportation.

Navigation: liquid fuels – CO_2

35. The ERT noted with appreciation the efforts made by Greece and reported in the NIR to develop country-specific carbon content data for fuels used in domestic navigation. However, the ERT notes that Greece has not attempted to follow the recommendation from the previous review report which recommended that Greece use bottom-up AD in order to estimate emissions from domestic navigation, citing lack of data as its reason for not addressing this recommendation. In response to a question raised by the ERT during the review week on the steps that Greece is taking to address this, the Party indicated that there is limited possibility to use detailed fleet data in order to estimate the emissions associated with navigation. The Party further observed that the application of a bottom-up methodology requires detailed data for the composition of the fleet and the routes performed. Given that CO_2 emissions from navigation is a key category, the ERT recommends that Greece introduce plans and measures aimed at improving CO_2 emission estimates from navigation by gathering information on the number of arrivals and departures, destination and fleet composition and, if necessary, take into consideration the experiences of other Parties in gathering such data.

4. Non-key categories

Solid fuel transformation: biomass – CH_4

36. The ERT noted that fugitive CH_4 emissions from charcoal production were not reported in Greece's original 2014 annual submission for the whole time series. In response to a question raised by the ERT during the review week, Greece confirmed that domestic production of charcoal does occur in the country even though the majority of it is imported.

In response to this question, the Party further provided official data on charcoal production in Greece in 2012 sourced from the energy balance, amounting to 1,000 t charcoal produced.

37. The ERT further noted that the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) (table 1-14) contain default CH_4 EFs for charcoal production. During the review, the Party estimated emissions from charcoal production using a combination of IEA data (for 1990–2004) and energy balance data (for 2005–2012) and by applying the aforementioned default EFs, resulting in estimates of 0.03 Gg CH_4 for 1990 and 0.04 Gg CH_4 for 2012. The ERT agrees with the CH_4 emission estimates provided by Greece and recommends that the Party transparently document the methods used to estimate and report CH_4 emissions from charcoal production in its NIR.

Other sectors: biomass – CH_4 and N_2O

38. In its original 2014 annual submission Greece did not report CH_4 and N_2O emissions associated with charcoal use. In response to a question raised by the ERT during the review week, Greece confirmed that domestic use of charcoal does occur in the country and that supply is mostly dominated by imports. Greece provided the ERT with official data on charcoal use in 2012 sourced from the energy balances, amounting to 1,769 TJ.

39. The ERT also noted that the Revised 1996 IPCC Guidelines contain EFs for charcoal for CH_4 (volume 3, table 1-7) and N_2O (volume 3, table 1-8). During the review, the Party submitted revised estimates of CH_4 and N_2O emissions from charcoal consumption, calculated using data from the IEA joint questionnaire collected for the period 1990–2012 and by applying the default EFs from the Revised 1996 IPCC Guidelines. The calculations resulted in an increase in the estimated CH_4 emissions from biomass combustion for other sectors (e.g. for 2012, residential, from 163.62 Gg CO_2 eq to 165.06 Gg CO_2 eq) and also resulted in minor changes to the estimated N_2O emissions. The ERT agrees with the revised estimates and recommends that the Party transparently document the methods used to estimate CH_4 and N_2O emissions from charcoal use in its NIR.

Oil and natural gas: liquid fuels – CO_2 and CH_4

40. The ERT noticed in the NIR that Greece has chosen the mid-range of CH_4 and CO_2 EFs from the Revised 1996 IPCC Guidelines (table 1.6 – Western Europe, 90–1400 kg/PJ for CH_4 for refining and storage) and the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) (table 2.16 for CO_2 and CH_4) for the other sub-sources under oil and natural gas to estimate CO_2 and CH_4 fugitive emissions without providing justification. In response to a question raised by the ERT during the review week, the Party explained that it plans to recalculate these emissions in its 2015 annual submission because the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) contains different tier 1 EFs compared with those sourced from the above-mentioned tables. The ERT noted the response by Greece and recommends that the Party document the justification for its use and selection of EFs for this category in the NIR.

C. Industrial processes and solvent and other product use

1. Sector overview

41. In 2012, emissions from the industrial processes sector amounted to 9,606.76 Gg CO_2 eq, or 8.7 per cent of total GHG emissions, and emissions from the solvent and other

product use sector amounted to 318.47 Gg CO_2 eq, or 0.3 per cent of total GHG emissions. Since the base year, emissions have decreased by 25.3 per cent in the industrial processes sector, and increased by 3.3 per cent in the solvent and other product use sector. The key driver for the fall in emissions in the industrial processes sector is a decrease in production of mineral products. Within the industrial processes sector, 41.2 per cent of the emissions were from consumption of halocarbons and SF_6, followed by 38.9 per cent from mineral products, 11.5 per cent from metal production and 8.4 per cent from chemical industry.

42. Greece has made recalculations between the 2013 and 2014 annual submissions for the industrial processes sector. The most significant recalculations made by Greece between the 2013 and 2014 annual submissions were in cement production (1990–2007; for 1990, an increase of 1.8 per cent) and ammonia production (1990 and 1991; for 1990, an increase of 171.4 per cent). The recalculations were made in response to the recommendations made in the 2013 annual review report. Compared with the 2013 annual submission, the largest recalculation was in 1990 where the emissions in the industrial processes sector increased by 532.56 Gg CO_2 eq (5.3 per cent), and increased total national emissions in 1990 by 0.5 per cent. The recalculations were adequately explained.

43. Greece has implemented several of the recommendations made in the previous review report (e.g. Greece has provided more information on SF_6 emissions from electrical equipment) and reports transparently in the NIR (chapter 9.4) on the follow-up to previous recommendations. Where the previous recommendations have not been fully implemented this is clearly described in the NIR. The ERT commends Greece for the transparent reporting on the follow-up to the review process and the implemented improvements based on the findings of previous reviews.

2. Key categories

Consumption of halocarbons and SF_6 – HFCs

44. As noted in the previous review report, Greece has been working to clarify potential HFC emissions from imported foam products. In the 2013 submission, Greece had received responses from 20 per cent of the members of the Pan-Hellenic Association of Insulating Companies. In the 2014 submission more than 30 per cent of the members have responded. All responses have indicated that no foam products containing HFCs are imported in Greece. The ERT commends Greece for its ongoing efforts and recommends that Greece continue the dialogue with the industry association in order to increase the percentage of respondents. Furthermore, the ERT recommends that Greece provide more information on the representativeness of the respondents to the survey.

45. Greece reports in the NIR (page 195) that for residential refrigeration the latest survey-based data are for 2009 and that data for 2010–2012 are extrapolated based on 2005–2009. However, it is not clear how this was done, since the number of refrigeration units increases from 2009 to 2010 and then decreases from 2010 to 2011 and further to 2012. In response to a question raised by the ERT during the review, Greece responded that the values reported in the NIR for 2012 were incorrect as the values for 2003 had been entered instead. The numbers reported in the CRF tables were correct. The ERT recommends that Greece correct this error.

46. Furthermore, Greece explained that the method of extrapolation used for the years 2010–2012 is that 2010 has been based on trend extrapolation of data from 2005–2009, 2011 has been based on data from 2006–2010 and 2012 has been based on data from 2007–2011. Greece provided further information on why this assumption was valid (based on communication with the sole manufacturer) for the domestic production of residential refrigeration appliances and informed the ERT that a new survey is expected to be published in time for the 2015 submission. The ERT notes that using already extrapolated

years as part of a rolling extrapolation is not considered scientifically sound and therefore recommends that Greece implement the results of the new survey in the annual submission.

47. During the review, the ERT identified from table 4.22 of the NIR that the number of transport refrigeration units decreases significantly from 2008 onwards (more than 90.0 per cent reduction). In response to a question raised by the ERT during the review, Greece explained that the data reported in the NIR is for new registrations and not the total number in operation. The same applies for the data presented on mobile air conditioners. The ERT recommends that Greece report data for both new registrations and the total units in operation.

48. Table 4.23 of the NIR presents the assumptions used in calculating emissions from refrigeration and air-conditioning equipment. According to the text of the NIR, the calculations are based on a mix of data from the IPCC good practice guidance and expert judgement; however, it is not clear which values are based on which source and also to what extent the expert judgements are consistent with the IPCC good practice guidance. In response to a question raised by the ERT during the review, Greece provided information for each subcategory under refrigeration and air-conditioning equipment on charges, leakage rates and lifetimes. The ERT recommends that Greece improve the transparency of the NIR by including information similar to that provided to the ERT during the review, including a plan for periodically verifying the expert judgements, because production and operating standards change over the years.

3. Non-key categories

Ammonia production – CO_2

49. As noted in the previous review report, the allocation of CO_2 emissions from ammonia production does not follow the IPCC good practice guidance for the early part of the time series (1990–1998). Based on the recommendation in the previous review report, Greece has reallocated emissions from lignite used as feedstock to the industrial processes sector. However, liquid fuels used as feedstock are still reported in the energy sector for 1990–1993 and 1995–1998. During the review, the ERT enquired about the status of reallocating the use of liquid fuels as feedstock to the industrial processes sector. In response, Greece explained the difficulties in addressing the recommendation, including that the plant in question has been closed for more than a decade, and stated that efforts are ongoing in cooperation with the energy sector expert. The ERT commends Greece for the improvements made and encourages Greece to continue its work on addressing the allocation of liquid fuels used as feedstock.

50. During the review, the ERT noted that the implied emission factor (IEF) for ammonia production decreases significantly between 2010 and 2011 (1.89 t/t and 1.67 t/t, respectively) and is based on the information on consumption of natural gas and carbon content in the NIR (page 167). Based on the ERT's replication of the calculation using the information in the NIR, the ERT considered that the emissions in 2010 could be overestimated. In response to a question raised by the ERT during the review, Greece explained that there was an error in the calculation sheet for ammonia production and informed the ERT of the correct numbers for 2009–2011. The ERT recommends that Greece correct this error and assess whether improvements should be made to the QC checks for this sector.

Other (chemical industry) – CO_2

51. Greece states in the NIR (page 175) that only CO_2 emissions from hydrogen production based on natural gas have been included in the industrial processes sector, while CO_2 emissions that result from liquid fuels being used as feedstock are reported in the energy sector. In response to a question raised by the ERT during the review, Greece

explained that liquid fuels are difficult to separate from the energy balance and for that reason their associated emissions are reported in the energy sector. The ERT recommends that Greece continue the work to estimate the amount of liquid fuels used as feedstocks for hydrogen production and report associated CO_2 emissions in other (chemical industry).

Iron and steel production – CO_2

52. The ERT noted that there is a marked decrease in the IEF for iron and steel production from 2007 (0.090 t/t) to 2008 (0.084 t/t) and 2009 (0.069 t/t). For 2010–2012 the IEF is on the level of 2009 (ranging from 0.063 t/t to 0.067 t/t). The discussion in the NIR (page 180) concerning the decrease in the IEF is very short and refers to annual variations in reducing agents, their carbon contents and scrap quality. In response to questions raised by the ERT during the review, Greece provided data on the quantity and average carbon content of the different inputs and outputs. Based on the data provided, it is clear to the ERT that the decrease is caused by lower carbon content in the iron scrap used in the electric arc furnaces. The ERT therefore recommends that Greece expand on the discussion of the IEF trend in the NIR, including the information provided to the ERT during the review.

D. Agriculture

1. Sector overview

53. In 2012, emissions from the agriculture sector amounted to 9,075.85 Gg CO_2 eq, or 8.2 per cent of total GHG emissions. Since 1990, emissions have decreased by 20.4 per cent. The key driver for the fall in emissions is a decrease in the amount of synthetic fertilizers applied to agricultural soils. Within the sector, 52.9 per cent of the emissions were from agricultural soils, followed by 34.4 per cent from enteric fermentation, 10.9 per cent from manure management. Rice cultivation accounted for 1.3 per cent and field burning of agricultural residues accounted for 0.5 per cent.

54. Greece has made recalculations between the 2013 and 2014 annual submissions for this sector. The most significant recalculation made by Greece between the 2013 and 2014 annual submissions was in the manure management category, and emissions from this category increased by 3.0 per cent for 1990 and decreased by 0.0 per cent for 2011). The recalculation was made in response to recommendations made in the 2013 annual review report. Compared with the 2013 annual submission, the effect of all recalculations increased total emissions in the agriculture sector for 2011 by 171.27 Gg CO_2 eq (1.9 per cent), and increased total national emissions by 0.1 per cent. The recalculations were adequately explained.

55. The ERT noted some transparency issues. For example, EFs and parameters used for calculating CH_4 emissions from enteric fermentation, CH_4 and N_2O emissions from manure management and N_2O emissions from agricultural soils are not adequately explained in the NIR. The ERT recommends that Greece provide sufficient information for those categories to improve the transparency of its reporting in the next submission.

56. Some recommendations made in the previous review report were not resolved. For example, although Greece used provisional data for calculating the emissions of enteric fermentation (e.g. sheep), manure management and agricultural soils, Greece did not explain the calculation method. Insufficient explanation about the provisional data had been pointed out in paragraph 44 in the previous review report, which included a strong recommendation that Greece provide a better explanation of the AD used for the inventory.[5]

[5] FCCC/ARR/2013/GRC, page 19.

The ERT reiterates the recommendations made in the previous review report that Greece use final data in a key category, improve the transparency of the provisional data and the data sources for all parameters used to estimate enteric fermentation emissions, improve the transparency of the allocation of manure management systems and document all AD data used when calculating emissions from agricultural soils.

2. Key categories

Enteric fermentation – CH_4

57. The previous review report recommended that Greece continue its efforts to develop country-specific values for methane conversion rate (Ym) and digestibility of feed based on national research, and to recalculate the emission estimates for the entire time series for dairy cattle. In its 2014 submission Greece recalculated the CH_4 emissions from dairy and non-dairy cattle using country-specific values for the Ym parameter and digestibility. The NIR states that digestibility values were decided by discussion of the bilateral review with agriculture experts from Spain. The Ym for both dairy and other cattle was derived from research, however the ERT considers that the explanation about the equation is insufficient. During the review week, the ERT questioned Greece about the equation. In response to the question raised by the ERT during the review, Greece provided a detailed explanation based on the work of Cambra-López et al (2008).[6] The ERT recommends that Greece provide an explanation of how the equation was developed in its annual submission.

58. CH_4 emissions from goats were estimated using a tier 1 IPCC methodology from the IPCC good practice guidance (page 4.23), although this source is a key category. Greece included in the NIR a plan to develop a tier 2 methodology, and in response to a question raised by the ERT during the review the Party explained that a process to obtain appropriate information to apply this tier 2 method had been initiated. The ERT recommends that Greece provide an update in its annual submission on this improvement.

59. In response to a question raised by the ERT during the review, Greece explained that in the NIR submitted in 2014 the CH_4 EF for poultry is based on country-specific data and the CH_4 EFs for animals except cattle, sheep and poultry is the default value from the Revised 1996 IPCC Guidelines (table 4-3). The ERT noted that, although the NIR contains a brief explanation about the estimation method (page 238), and the EFs used were provided in the NIR, there was no information in the NIR supporting the use of these EFs. In particular, the ERT noted that because the default EF for poultry is not provided in the Revised 1996 IPCC Guidelines or in the IPCC good practice guidance, Greece needs to explain the country-specific EF used to estimate emissions from poultry. In response to a question raised by the ERT during the review, Greece explained that the EF for poultry was 0.019 kg CH_4/head/yr, which was used in Switzerland. The ERT recommends that Greece show all EFs in tabular format, and also that the Party provide detailed information to explain the reasons for using the Swiss EF for poultry.

Manure management – N_2O

60. In its 2014 submission Greece updated the distribution of AWMS for all animal types, including the shares of volatile solid (VS) excretion per AWMS. This improvement was made in response to a recommendation made in the previous review report to improve the description of the method used, in particular for the expert judgement, and rectified the error related to the input of data on the MCF in CRF table 4.B(a). Further, Greece improved

[6] Cambra-López M, García Rebollar P, Estellés F and Torres A. 2008. Estimation of emissions from ruminants in Spain: the methane conversion factor. *Archivos de Zootécnia*. Available at: <http://www.uco.es/organiza/servicios/publica/az/php/az.php?idioma_global=0&revisiones=143&codigo=1640>.

the description of the method used to derive the AWMS fractions (liquid and solid systems) from manure separation. In its NIR, Greece has provided a detailed explanation of the method, but only for other cattle and buffalo; therefore the explanation is insufficient. In response to a question raised by the ERT during the review week, Greece provided the ERT with information on the detailed estimation method for the allocation of manure management systems for other cattle and buffalo. The ERT recommends that Greece include this detailed explanation in its annual submission.

61. The NIR does not show the N_2O EFs of all animals, nor the nitrogen (N) excretion rates of some animals used to calculate N_2O emissions. The ERT notes that the information provided on the N_2O EFs and parameters is insufficient. In response to a question raised by the ERT during the review, Greece provided the N_2O IEF. The ERT recommends that Greece provide all the N_2O EFs and parameters used for calculating N_2O emissions, for example in tabular format, in its annual submission.

Agricultural soils – N_2O

62. In response to a strong recommendation made in the previous review report, Greece included in its 2014 submission information regarding the completeness of mineral fertilizer consumption AD. Further, this information included the N values of animal manure and sewage applied to soil, but it did not include N-fixing crops or crop residues. In response to a question raised by the ERT during the review, Greece clarified that for N-fixing crops and crop residues, AD is crop production or crop area and crop yield per area. Additionally, the explanation about the calculation method is insufficient, for the categories direct soil emissions and indirect emissions. Although the NIR includes a brief explanation about the calculation method and a description of the N_2O EFs, no equations nor all EFs were described in the NIR. In addition, although provisional AD was used in all calculations to estimate direct soil emissions (except sewage sludge), no explanation was provided. The ERT recommends that Greece improve the transparency of its reporting by including in itsannual submission all equations, all factors and the N values of all AD applied to soils that are used to estimate N_2O emissions.

63. In response to a strong recommendation made in the previous review report, Greece has strengthened arrangements with EL.STAT (the Hellenic Statistical Authority) and the Pan-Hellenic Association of Professional Fertilizer Producers & Dealers (PHAPFDP) to vastly improve the quality of mineral fertilizer consumption data, and supporting information. The ERT considers that this improvement has resolved the issue raised in the previous review report.

3. Non-key categories

Manure management – CH_4

64. Although the NIR provides a brief explanation about the method used to estimate CH_4 emissions from animals except cattle and sheep, the CH_4 EFs and parameters used were not described in detail. In response to a question raised by the ERT during the review, Greece provided additional information on the CH_4 EFs and parameters used for cattle and sheep. This additional information has improved the transparency of the emission estimates, and the ERT recommends that Greece include this additional information in tabular format in its annual submission.

E. Land use, land-use change and forestry

1. Sector overview

65. In 2012, net removals from the LULUCF sector amounted to 2,865.55 Gg CO_2 eq. Since 1990, net removals have increased by 35.5 per cent. The key drivers for the rise in removals are the increase in carbon stocks in the living biomass pool in forest land and an increase in the carbon stock of mineral soils after conversion of cropland to grassland. Within the sector, 1,900.79 Gg CO_2 eq of net removals were from forest land, followed by 895.10 Gg CO_2 eq from grassland and 227.31 Gg CO_2 eq from cropland. Net emissions were reported from other land (130.25 Gg CO_2 eq) and 24.53 Gg CO_2 eq from settlements. Wetlands accounted for net emissions of 2.87 Gg CO_2 eq.

66. Greece has made recalculations between the 2013 and 2014 annual submissions for this sector. The most significant recalculations made by Greece between the 2013 and 2014 annual submissions were in the following categories: grassland (for 2011, a decrease of 14,082.2 per cent) and wetlands (for 2011, an increase/decrease of 1,643.4 per cent). The recalculations were made in response to the 2013 annual review report, following changes in AD and due to including estimates for new categories (see para. 69 below) for the first time. During the review, the Party was requested to provide estimates for CO_2, CH_4 and N_2O wildfire emissions for missing pools (litter and deadwood) in forest land (see para. 75). During the review, Greece submitted revised CRF tables, which included the emission estimates for the missing pools. Compared with the 2013 annual submission, the recalculations increased removals in the LULUCF sector for 2011 by 393.52 Gg CO_2 eq (15.4 per cent). The recalculations were adequately explained. The ERT commends the Party for these improvements.

67. Greece provided annual land-use change matrices for the period 1990–2012 as recommended in the previous review report. However, Greece reports grassland converted to forest land and cropland converted to settlement as "NE" (not estimated) and it is not transparent how Greece has developed the annual land-use change matrices without these categories. During the review, in response to questions raised by the ERT, Greece explained that grassland converted to forest lands occur as a result of natural expansion, but there are currently no methodologies available for the Party to track these areas over time. The ERT reiterates the recommendation made in the previous review report that Greece provide transparent information on how the annual land-use change matrices have been developed and report a complete set of annual land-use change matrices in its next annual submission (see para. 68 below). Particular attention should be given to the following considerations:

(a) Even if a land use or land-use change results in no emissions, it is good practice to report its area and use the appropriate notation keys for emission or removal estimates;

(b) Where relevant, grassland, wetlands and other land should be divided into "managed" and "unmanaged" subcategories. Although emissions or removals of unmanaged lands do not need to be reported, reporting the area would allow the consistency of data to be transparently justified;

(c) The use of available data sources (such as the first National Forest Inventory (NFI) and the Forest Resources Assessment published by the Food and Agriculture Organization of the United Nations (FAO)) to subcategorize managed and unmanaged forests is to be encouraged, so that the emissions from managed land can be transparently illustrated in the CRF tables and the NIR.

68. In the CRF tables, Greece has reported the following areas for total forest land: 3,359.07 kha in 1990, 3,379.47 kha in 2000, 3,387.56 in 2005 and 3,387.94 kha in 2010.

These areas are significantly inconsistent with data on total forest area provided by Greece to FAO[7] for the same years (forest area of Greece was 3,299 kha in 1990, 3,601 kha in 2000, 3,752 kha in 2005 and 3,903 kha in 2010). The ERT recommends that Greece in its annual submission include an explanation of the differences in area data reported in the CRF tables when compared to corresponding data reported by the Party to FAO for forest land, land remaining forest land and lands converted to forest land, and provide the rationale for the selection of area data used for the development of annual land-use change matrices, including assessment of areas of natural forest expansion.

69. The completeness of the LULUCF sector of Greece's inventory has been improved due to the estimation of new pools and categories in response to recommendations from previous review reports: carbon stock changes in mineral soils in grassland converted to cropland, settlements, other land; carbon stock changes in dead organic matter and mineral soils in grassland converted to wetlands; N_2O emissions from disturbance associated with land-use conversion to cropland; and carbon stock changes in living biomass in cropland converted to grassland. The ERT commends the Party for these improvements.

70. The LULUCF sector of Greece's inventory is generally complete with only a few pools in the mandatory categories reported as "NE": carbon stock changes in the living biomass and dead organic matter pools in grassland converted to forest land; and carbon stock changes in living biomass in cropland converted to settlements. According to the explanation in the NIR, Greece clarified that this was due to a lack of sufficient information, including AD. The ERT recommends that Greece make efforts to collect the necessary information and report the AD and emission/removal estimates for the above-mentioned pools in future annual submissions.

71. The ERT notes that chapter 7 of the NIR does not follow the UNFCCC reporting guidelines and the annotated outline (i.e. specific sections on QA/QA, uncertainty assessment, planned improvements and so on have not been included in chapter 7). In response to a question raised by the ERT during the review, Greece provided the explanation that the NIR includes all the necessary information required in other chapters (e.g. for QA/QC, information is provided on pages 29 and 270, and information on implemented and planned recalculations and improvements is provided on page 271 of the NIR). The ERT encourages the Party to follow the annotated outline and include the currently missing subsections in the NIR for its annual submission.

72. The ERT identified that the NIR does not provide detailed information on the uncertainty analysis, including the uncertainty values used for AD and EFs and whether these are country-specific or default values. The ERT reiterates the recommendation made in the previous review report that Greece provide detailed and transparent information on the uncertainty assessment for the LULUCF sector in the annual submission.

2. Key categories

Forest land remaining forest land – CO_2

73. Greece has used the carbon stock change method from the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) to estimate the carbon stock changes in the above- and below-ground biomass pools in forest land remaining forest land. In line with a recommendation in the previous review report, the Party has performed a verification of the results using the IPCC gain and loss method with implementation of the Carbon Budget Model (CBM) developed by the Canadian Forest Service. Greece's input information on

[7] Available at <http://www.fao.org/docrep/013/al515E/al515E.pdf>.

the forest area under management, growing stock and annual increment of growing stock, reference year, forest fire area, and harvest amount were used for simulation. As a result of comparing the two methods, Greece has concluded that the carbon stock change method from the IPCC good practice guidance for LULUCF provides more conservative estimations of net removals by biomass pool. The ERT commends the Party for these efforts.

3. Non-key categories

Land converted to forest land – CO_2

74. In the NIR (page 286), Greece provides information clarifying that emissions and removals from grassland conversions to forest due to natural expansion are considered to be unmanaged and therefore should not be reported under the Convention and the Kyoto Protocol. In the NIR, Greece only considers lands that are artificially afforested to be directly human induced afforestation. The ERT agrees with the Party's interpretation and reporting of directly human induced activities only. The ERT encourages Greece to collect AD and report emissions and removals associated with naturally expanding forest lands under its LULUCF Convention reporting.

Biomass burning – CO_2, CH_4 and N_2O

75. Greece reports wildfire emissions (CH_4 and N_2O) from forest land excluding deadwood and litter (NIR, page 285). The ERT considers that emissions from these pools in areas subjected to wildfire were underestimated. In response to a question raised by the ERT during the review, Greece has recalculated and resubmitted emissions from wildfires, including missing pools, using data on deadwood and litter stocks from the NIR and with the conservative assumption about immediate oxidation of these pools after fire. The impact of including CO_2, CH_4 and N_2O emissions from litter and deadwood in the resubmitted data for forest land is an increase in emissions from wildfires from 6.73 Gg CO_2 to 85.51 Gg CO_2 eq (1,171.4 per cent) for 2012. The ERT commends Greece for these efforts and encourages the Party to refine the conservative methodological approach, as improved estimates for the combustion fraction for deadwood and litter due to fires become available, to avoid overestimation of emissions from these pools in the future.

F. Waste

1. Sector overview

76. In 2012, emissions from the waste sector amounted to 4,735.23 Gg CO_2 eq, or 4.3 per cent of total GHG emissions. Since 1990, emissions have decreased by 19.6 per cent. Complex opposing processes can be observed behind this falling trend. A growing population resulted in higher waste generation which led to increasing CH_4 emissions from waste disposal in spite of growing biogas capture and utilization. Meanwhile, emissions from wastewater handling were significantly reduced as most of the population became connected to centralized aerobic wastewater treatment plants. Within the sector, 67.7 per cent of the emissions were from solid waste disposal on land, followed by 31.5 per cent from wastewater handling. Waste incineration and other (waste) accounted for 0.1 per cent and 0.7 per cent, respectively.

77. The Party has made recalculations between the 2013 and 2014 annual submissions for this sector. The two most significant recalculations made by Greece between the 2013 and 2014 annual submissions were in the following categories: solid waste disposal on land (for 2011, an increase of 2.9 per cent) and wastewater handling (for 1990, an increase of 10.4 per cent; for 2011, an increase of 4.4 per cent). The recalculations were made primarily following changes in AD, such as the amount of disposed waste or the degradable

organic component in wastewater, with a larger impact from the latter. The ERT noted that in contrast with the previous submission, Greece has decided not to take into account estimated figures for CH_4 recovery from biogas flaring, which is in line with the IPCC good practice guidance (page 5.10) because no references documenting the amount of CH_4 recovery from flaring are available. Compared with the 2013 annual submission, the recalculations increased emissions in the waste sector for 2011 by 181.62 Gg CO_2 eq (3.9 per cent), and increased total national emissions by 0.2 per cent in 2011. The recalculations were adequately explained.

78. The ERT identified some incorrect or inconsistent numbers in figures and tables in the NIR (e.g. in table 8.18 the column "Total" contains incorrect values). The ERT recommends that the Party enhance its QC procedures to prevent such inconsistencies in future annual submissions.

2. Key categories

Solid waste disposal on land – CH_4

79. Greece has applied the first-order decay (FOD) model from the IPCC good practice guidance to estimate CH_4 emissions from landfills. The AD and parameters used are well documented in the NIR. Compared with the previous submission, the Party has increased the transparency of its reporting by adding, among other things, a new table containing the parameters used for the estimation of emissions in this category. Greece has also included a flow chart in the NIR (page 325) that summarizes all the solid waste flows in the country. The ERT commends Greece for this development. The ERT noted, however, that the waste amounts presented in the flow chart do not correspond with the waste amounts in CRF table 6.A. For example, in the flow chart, 4,424 kt of municipal solid waste goes to managed solid waste disposal sites and 27 kt to unmanaged sites, whereas in the CRF tables, 4,242 kt is reported for managed sites and 265 kt to unmanaged ones. The ERT also found similar discrepancies for other waste types (industrial, construction and demolition). During the review week, in response to questions raised by the ERT, Greece confirmed that the correct values are those in the CRF tables. The ERT recommends that Greece enhance its QC procedures to prevent such inconsistencies in its future annual submissions.

Wastewater handling – CH_4

80. For domestic and commercial wastewater, Greece has updated the previously used per capita degradable organic component, and now uses a higher value (from 0.05 to 0.057 kg biochemical oxygen demand/person/day). Furthermore, by estimating the total organic load of wastewater, the output of tourists is also taken into account. As recommended in the previous review report, the methodological description in the NIR has been enhanced (page 340). The ERT commends Greece for this development. However, from the NIR it was still not fully clear what MCFs were applied for the different treatment types. During the review, Greece clarified that it considers treatment in centralized treatment plants to be fully aerobic, thus it uses MCF=0, whereas for the part of the population not connected to treatment plants fully anaerobic processes are assumed (i.e. MCF=1 is used). The ERT recommends that Greece include all important parameters (especially MCF) for all types of treatment in the NIR to further increase the transparency of its reporting. In addition, as current science indicates lower MCF values for many untreated or domestically treated systems, the Party is encouraged to revise its currently used MCF value for the population not connected to centralized treatment plants.

81. The ERT noted that no CH_4 recovery is reported, although biogas production statistics indicate that sewage sludge gas is also produced. During the review, Greece confirmed that the data presented in the national energy balance correspond to gas recovered in municipal wastewater treatment plants from anaerobic sludge digestion. The

Party also expressed its concern regarding a possible underestimation of the emissions from this source if CH_4 recovery was taken into account. The ERT considers that using a notation key "NO" (not occurring) for an activity that actually occurs is not appropriate. Moreover, reporting an estimate for recovery does not necessarily mean that the currently reported emissions in domestic and commercial wastewater would decrease, especially as all emissions in the recent methodology originate from the part of the population not connected to wastewater plants. The ERT recommends that Greece change its reporting on CH_4 recovery either by providing an estimate of the amount of recovered CH_4, or by replacing the currently used notation key with "NE" for the case where no numerical estimate is available.

82. In the reporting of industrial wastewater handling, the ERT detected different values for organic product (chemical oxygen demand (COD)) in the NIR (table 8.20) and the CRF tables (e.g. for 2012, the sum of COD values is 249.23 kt in table 8.20, and 162.51 kt in CRF table 6.B). In response to a question raised by the ERT during the review, Greece explained that it included only the part of COD that is treated anaerobically in the CRF tables. This is not consistent with the IPCC good practice guidance and has resulted in higher IEF values reported by the Party (0.25) when compared to other reporting Parties (0.001–0.25). The ERT recommends that Greece increase the consistency of information between the NIR and the CRF tables, preferably by also reporting the total organic waste from the relevant industries in the CRF tables. The ERT also encourages the Party to investigate whether CH_4 recovery occurs in anaerobic industrial wastewater treatment plants.

3. Non-key categories

Wastewater handling – N_2O

83. Greece used a constant protein consumption of 42.23 kg/person for the period 2009–2012 for estimating N_2O emissions from human sewage. The NIR (page 343) states that data on protein consumption were provided by the FAO. The ERT noted that by the time of the review, the FAOSTAT database contain somewhat lower values, with yearly variations between 41.4 and 40.7 kg for the period 2009–2011 which indicates a slight overestimation of N_2O estimates by Greece. The ERT encourages the Party to update the time series of AD using the most recent information available.

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

84. Table 6 provides an overview of the information reported and parameters selected by Greece under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 6
Supplementary information reported under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Issue	*Expert review team assessment, if applicable*	*Findings and recommendations*
Assessment of the Party's reporting in accordance with the requirements in	Sufficient	Greece has provided information on how land with temporary forest cover loss is distinguished from deforestation, as requested in the previous review

Issue	*Expert review team assessment, if applicable*	*Findings and recommendations*
paragraphs 5–9 of the annex to decision 15/CMP.1		report (see para. 89 below). In addition, Greece has provided relevant information that demonstrates that unreported pools are not a source (see paras. 87 and 91 below)
Activities elected under Article 3, paragraph 4, of the Kyoto Protocol	Forest management Years reported: 2008, 2009, 2010, 2011, 2012	
Period of accounting		Commitment period
Party's ability to identify areas of land and areas of land-use change in accordance with paragraph 20 of the annex to decision 16/CMP.1	Sufficient	

85. Section G.I includes the ERT's assessment of the 2014 annual submission against the Article 8 review guidelines and decisions 15/CMP.1 and 16/CMP.1. In accordance with decision 6/CMP.9, Parties will begin reporting of KP-LULUCF activities in the submissions due by 15 April 2015 using revised CRF tables, as contained in the annex to decision 6/CMP.9. Owing to this change in the CRF tables for KP-LULUCF activities and the change from the first commitment period to the second commitment period, paragraphs 87–94 below contain the ERT's assessment of the Party's adherence to the current reporting guidelines and do not provide specific recommendations for reporting of these activities for the 2015 annual submission.

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

Afforestation and reforestation – CO_2, CH_4 and N_2O

86. The previous ERT strongly recommended that Greece should map and report removals and emissions associated with grassland conversion to forest land under afforestation and reforestation. In the NIR, Greece provides information verifying that emissions and removals from all grassland conversions to forest due to natural expansion are not considered to be directly human induced and, therefore, should not be reported under Article 3, paragraph 3, of the Kyoto Protocol as specified in paragraph 8(a) of the annex to decision 15/CMP.1. In the NIR, Greece only considers lands that are artificially regenerated to result in emissions that are directly human induced afforestation. The ERT agrees with the Party's interpretation and reporting of directly human induced activities only.

87. Greece does not report emissions or removals from deadwood, litter and soil carbon pools, but does provide information in the NIR that attempts to demonstrate that these pools are not a source. However, during the review and in response to a request by the ERT, the Party provided additional data to verify that the deadwood and litter pools are not a net source based on data from the European BioSoil project for Greece (level II plots representative of major forest types in Greece). The ERT welcomes this information, and

considers that the Party has demonstrated and reported that unaccounted pools are not a source, as required under paragraph 6(e) of the annex to decision 15/CMP.1.

88. Greece reports CO_2, CH_4 and N_2O emissions from biomass burning in afforested and reforested land, but does not estimate emissions for deadwood and litter. This is an issue of completeness and, given that litter and deadwood CO_2 emissions are reported for deforestation, failure to estimate emissions from these pools in areas subjected to wildfire is unbalanced reporting. During the review, the ERT asked the Party to provide estimates for CO_2, N_2O and CH_4 wildfire emissions from the litter and deadwood pools based on documented methodologies used for estimating deadwood and litter stock and by applying a conservative assumption that all litter and deadwood is oxidized. The Party provided the requested information. The impact of including emissions from litter and deadwood in the resubmitted data for afforestation and reforestation activities resulted in an increase in emissions from wildfires of 0.21 to 1.16 Gg CO_2 eq (1,171.4 per cent) over the period 2008–2012. The ERT commends Greece for resubmitting the data and encourages the Party to refine the conservative methodological approach, as improved estimates for the combustion fraction for deadwood and litter due to fires become available, to avoid overestimation of emissions from these pools.

Deforestation – CO_2 and N_2O

89. Following a recommendation made in the previous review report, Greece has provided information in the NIR on how harvesting or forest disturbance that is followed by re-establishment is distinguished from deforestation. The Party describes a range of laws that govern resource utilization and protection of forest land. The ERT considers that these laws and the land-use change database, supplied by MEECC, provide a sufficient basis to distinguish between temporarily unstocked forest areas and deforestation as set out in paragraph 8(b) of the annex to the decision 15/CMP.1. The ERT commends the Party for these improvements to the NIR and further encourages the Party to document how the Forest Service tracks forest lands that have temporarily lost forest cover, but have not been classified as deforested land.

90. Greece has provided estimates of N_2O emissions from disturbance of croplands under deforestation activities, as recommended in the previous review report. These estimates have been accurately and transparently reported in both the CRF tables and the NIR. The ERT commends Greece for these improvements.

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

Forest management – CO_2, CH_4 and N_2O

91. Greece does not estimate CO_2 emissions or removals from the soil, litter and deadwood pools, and provided a qualitative description to demonstrate that unreported pools under forest management are not a source. However, during the review and upon the request of the ERT, the Party provided additional data to verify that deadwood, litter and soil pools are not a sink, based on data from the BioSoil project and deadwood IEFs (0.002 Mg C/ha) from four neighbouring Italian regions (Abruzzo, Molise, Basilicata, and Puglia), with the most similar climatic and ecological conditions to Greece. The ERT welcomes this information and considers that the Party has demonstrated and reported that the unaccounted pools for forest management under Article 3, paragraph 4, of the Kyoto Protocol are not a source, as required under paragraph 6(e) of the annex to decision 15/CMP.1.

92. Greece reports CO_2, CH_4 and N_2O emissions from biomass burning in land subject to forest management, but does not estimate wildfire emissions for deadwood and litter. This is an issue of completeness and, given that litter and deadwood emissions are reported for deforestation, failure to estimate emissions from these pools in areas subjected to

wildfires is unbalanced reporting. During the review, the ERT asked the Party to provide estimates for CO_2, N_2O and CH_4 wildfire emissions from the litter and deadwood pools based on documented methodologies used for estimating deadwood and litter stock and by applying a conservative assumption that all litter and deadwood is oxidized. The Party provided the requested information. The impact of including emissions from litter and deadwood in the resubmitted data for forest management activities is an increase in emissions from wildfires of 0.21 to 1.16 Gg CO_2 eq (1,171.4 per cent) over the period 2008–2012. The ERT commends Greece for resubmitting the data and encourages the Party to refine the conservative methodological approach, as improved estimates for the combustion fraction for deadwood and litter due to fires become available, to avoid overestimation of emissions from these pools in the future.

93. Greece provides sufficient information to demonstrate that emissions or removals associated with activities under Article 3, paragraph 4, of the Kyoto Protocol are not accounted for under activities under Article 3, paragraph 3. The ERT would, however, encourage the Party to use the headings provided in the annotated NIR outline[8] to improve the transparency of reporting this information.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

94. Greece 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 included in the standard independent assessment report (SIAR) on the SEF tables and the SEF comparison report.[9] 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.

95. Information on the accounting of Kyoto Protocol units has been prepared and reported in accordance with decision 15/CMP.1, annex, chapter I.E, 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 (ITL) and the clean development mechanism registry and meets the requirements referred to in decision 22/CMP.1, annex, paragraph 88(a–j). 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 discrepancy has been identified by the ITL and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

Accounting of activities under Article 3, paragraph 3, of the Kyoto Protocol and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol

96. Greece has reported information on its accounting of KP-LULUCF in the accounting table, as included in the annex to decision 6/CMP.3. Information on the accounting of KP-LULUCF has been prepared and reported in accordance with decisions 16/CMP.1 and 6/CMP.3.

[8] Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/reporting_requirements/application/pdf/annotated_nir_outline.pdf>.

[9] The SEF comparison report is prepared by the international transaction log (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.

97. Table 7 shows the accounting quantities for KP-LULUCF as reported by the Party and the final values after the review.

Table 7
Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol, in t CO_2 eq

	2014 annual submission[a]		
	As reported	*Revised estimates*	*Final accounting quantity*[b]
Afforestation and reforestation			
Non-harvested land	–696 111	–692 398	–692 398
Harvested land	NA		NA
Deforestation	290 366		290 366
Forest management	–1 650 000		–1 650 000
Article 3.3 offset[c]	0		0
Forest management cap[d]	–1 650 000		–1 650 000
Cropland management	NA		NA
Grazing land management	NA		NA
Revegetation	NA		NA

Abbreviations: CRF = common reporting format, 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.

[a] The values included under the 2014 annual submission are the cumulative accounting values for 2008, 2009, 2010, 2011 and 2012, as reported in the accounting table of the KP-LULUCF CRF tables for the inventory year 2012.

[b] The "final accounting quantity" is the quantity of Kyoto Protocol units that the Party shall issue or cancel under each activity under Article 3, paragraph 3, and paragraph 4, if relevant, based on the final accounting quantity in the 2014 annual submission.

[c] "Article 3.3 offset": for the first commitment period, a Party included in Annex I to the Convention that incurs a net source of emissions under the provisions of Article 3, paragraph 3, of the Kyoto Protocol may account for anthropogenic greenhouse gas emissions by sources and removals by sinks in areas under forest management under Article 3, paragraph 4, up to a level that is equal to the net source of emissions under the provisions of Article 3, paragraph 3, but not greater than 9.0 megatonnes of carbon times five, if the total anthropogenic greenhouse gas emissions by sources and removals by sinks in the managed forest since 1990 is equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

[d] In accordance with decision 16/CMP.1, annex, paragraph 11, for the first commitment period only, additions to and subtractions from the assigned amount of a Party resulting from forest management under Article 3, paragraph 4, of the Kyoto Protocol after the application of decision 16/CMP.1, annex, paragraph 10, and resulting from forest management project activities undertaken under Article 6, shall not exceed the value inscribed in the appendix of the annex to decision 16/CMP.1, times five.

98. Based on the information provided in table 7 for the activity afforestation and reforestation, Greece shall for non-harvested land, issue 692,398 removal units (RMUs) in its national registry.

99. Based on the information provided in table 7 for the activity deforestation, Greece shall cancel 290,366 assigned amount units (AAUs), emission reduction units (ERUs), certified emission reduction units (CERs) and/or RMUs in its national registry.

100. Based on the information provided in table 7 for the activity forest management, Greece shall issue 1,650,000 RMUs in its national registry.

Calculation of the commitment period reserve

101. Greece has reported its commitment period reserve in its 2014 annual submission. Greece reported its commitment period reserve to be 575,225,094 t CO_2 eq based on the national emissions in its reviewed inventory of the 2013 inventory submission (115,045.02

Gg CO_2 eq for 2011). However, the ERT noted that the most recently reviewed inventory is that for 2012 (110,994.06 Gg CO_2 eq). Therefore the ERT disagrees with the commitment period reserve reported by the Party in its 2014 annual submission. Greece submitted revised estimates during the course of the review and the commitment period reserve has been calculated by the Party to be 554,970,299 t CO_2 eq (based on the total national emissions for 2012). The ERT agrees with this figure. The ERT reiterates the recommendation from the previous review report that Greece report accurate information on its commitment period reserve in its annual submission.

3. Changes to the national system

102. Greece reported that there are no changes in its national system since the previous annual submission. However, during the review the ERT noted that the regulatory documents, which underpin the functioning of the national system, referred back to 2008. The ERT further noted that changes in the Government of Greece took place in 2009, which resulted in the formation of MEECC. In response to questions raised by the ERT during the review, the Party explained that alongside the changes in the Government, the new MEECC retained the responsibilities of the former Ministry of Environment and undertook additional responsibilities, which resulted in the enhancement of the national system functions. Greece further informed the ERT on the ongoing update of Circular 918/21-4-08 that regulates the functioning of the national system.

103. The ERT concluded that the changes in the Government of Greece did not affect the ability of the national system to perform its functions. Greece's national system continues to be in accordance with the requirements of national systems set out in decision 19/CMP.1. The ERT recommends that the Party proceed with the update of legislative documents that regulate the functioning of the national system and report on the outcomes in its annual submissions in accordance with decision 15/CMP.1, annex, chapter I.F. and/or further relevant decisions of the CMP.

4. Changes to the national registry

104. Greece provided information on changes to its national registry in its annual submission. The Party reported the following changes in the national registry: changes to registry contact details and structural changes to the registry database due to release 5 and 6 of the national registry which only affected EU ETS functionality. The ERT concluded that, taking into account the confirmed changes in the national registry, Greece'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

105. Consistent with paragraph 23 of the annex to decision 15/CMP.1, Greece provided information relating to how it is striving, under Article 3, paragraph 14, of the Kyoto Protocol, to implement its commitments in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention.

106. In its NIR, Greece described two major EU policies: directive 2009/28/EC on the promotion of the use of energy from renewable sources; and directive 2008/101/EC amending directive 2003/87/EC so as to include aviation activities in the scheme for GHG emission allowance trading within the EU, both of which have been identified as having a potential impact on developing countries. The impact assessments related to enhanced

biofuel and biomass use at an EU level showed that the cultivation of energy crops could have both positive and negative impacts. Greece is in the process of transposing the directive into national law. As the issue of the sustainability criteria is of high importance to Greece, Greece will adopt national measures in order to respect the sustainability criteria and assess the impact of the production of biofuels on soil, water and biodiversity in developing countries. Another action is the execution of research on second-generation biomass technologies by its research centres and Greek universities. The goal of second-generation biofuel processes is to extend the amount of biofuel that can be produced sustainably by using biomass consisting of the residual non-food parts of current crops. Directive 2008/101/EC has impacts on the aircraft operators from developing countries that operate on routes covered by the scheme. In order to reduce the aggregated costs for developing country airlines, especially from regions that include developing countries, airlines operating limited services are exempt from the EU scheme.

107. Greece reported that there are no changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, since the previous annual submission. The ERT concluded that the information provided continues to be complete and transparent.

III. Conclusions and recommendations

A. Conclusions

108. Table 8 summarizes the ERT's conclusions on the 2014 annual submission of Greece, in accordance with the Article 8 review guidelines.

Table 8
Expert review team's conclusions on the 2014 annual submission of Greece

Issue	*Expert review team assessment*	*Paragraph cross-references for identified problems*
The ERT concludes that the inventory submission of Greece is complete with regard to categories, gases, years and geographical boundaries and contains both an NIR and CRF tables for 1990–2012		
Annex A sources[a]	Complete	
LULUCF[a]	Not complete	73
KP-LULUCF	Complete	
The ERT concludes that the inventory submission of Greece has been prepared and reported in accordance with the UNFCCC reporting guidelines	Generally	Table 3, para. 74
The Party's inventory is in accordance with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF	Yes	
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	Yes	

Issue	*Expert review team assessment*	*Paragraph cross-references for identified problems*
Greece has reported information on its accounting of Kyoto Protocol units in accordance with decision 15/CMP.1, annex, chapter I.E, and used the required reporting format tables as specified by decision 14/CMP.1	Yes	
The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1	Yes	
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	Yes	
Did the Party provide information in the NIR on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol?	Yes	

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, CRF = common reporting format, ERT = expert review team, IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = IPCC *Good Practice Guidance for 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, LULUCF = land use, land-use change and forestry, NIR = national inventory report, Revised 1996 IPCC Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, UNFCCC reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories".

[a] The assessment of completeness by the ERT considers only the completeness of reporting of mandatory categories (i.e. categories for which methods and default emission factors are provided in the Revised 1996 IPCC Guidelines, the IPCC good practice guidance or the IPCC good practice guidance for LULUCF).

B. Recommendations

109. The ERT identified the issues for improvement listed in table 9. All recommendations are for the next annual submission, unless otherwise specified.

Table 9
Recommendations identified by the expert review team

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation ?*	*Paragraph cross-references*
Cross-cutting	General	Fully address the recommendations of the previous review that have not yet been fulfilled		12
		Enhance the use of notation keys in its NIR and the CRF tables	Yes	13
	QA/QC	Strengthen the QA/QC procedures	Yes	14

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation ?*	*Paragraph cross-references*
		Include the QA/QC plan in the next inventory submission and provide the timeline for implementation of the sector-specific and general QA/QC procedures	No	15
	Transparency	Provide all the necessary information on the AD and EFs used in the GHG calculation	Yes	16
		Justify the use of default EFs under tier 2 methods	No	16
	Key categories	Derive country-specific parameters and develop higher tier methods for key categories	No	17
Energy	General	Transparently describe in the NIR how the quantification of uncertainty estimates associated with AD and EFs for stationary combustion is derived from EU ETS data	No	26
	QA/QC	Report the emissions currently allocated under venting (1B2ci) separately under oil transport	No	27
	International statistics	Harmonize all energy data sets used for international reporting	No	29
	Feedstocks and non-energy use of fuels	Implement the reallocation of emissions from the energy sector to the industrial processes sector and transparently document the impact of this reallocation in the relevant source categories as well as in the comparison between the reference and sectoral approaches	Yes	31
	Road transportation: liquid, gaseous fuels and biomass – CO_2, CH_4 and N_2O	Put measures in place to reduce statistical errors in the fuel data and improve the accuracy of LPG consumption in the energy balance	Yes	33
		Present in tabular format a comparison of the results of fuel consumption showing those results estimated using the COPERT model and the energy balance	No	33
		Reallocate emissions from road transportation to other transportation	No	34
	Navigation: liquid fuels – CO_2	Introduce plans and measures aimed at improving CO_2 emission estimates from navigation by gathering information on the number of arrivals and departures, destination and fleet composition and, if necessary, take into consideration the	No	35

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation ?*	*Paragraph cross-references*
		experiences of other Parties in gathering such data		
	Solid fuel transformation: biomass – CH_4	Transparently document the methods used to estimate and report CH_4 emissions from charcoal production in the NIR	No	37
	Other sectors: biomass – CH_4 and N_2O	Transparently document in its NIR the methods used to estimate CH_4 and N_2O emissions from charcoal use	No	39
	Oil and natural gas: liquid fuels – CO_2 and CH_4	Document in the NIR the justification for the use and selection of EFs for this source category	No	40
Industrial processes and solvent and other product use	Consumption of halocarbons and SF_6 – HFCs	Continue the dialogue with the industry association in order to increase the percentage of respondents, and provide more information on the representativeness of the respondents to the survey	No	44
		Correct the error in the values reported in the NIR for residential refrigeration	No	45
		Implement the results of the new survey in the 2015 submission	No	46
		Report data for transport refrigeration units and mobile air conditioners for both new registrations and the total units in operation	No	47
		Improve the transparency of the NIR by including information similar to that provided to the ERT during the review, including a plan for periodically verifying the expert judgements	No	48
	Ammonia production – CO_2	Correct the error in the calculation sheet and assess whether improvements should be made to the QC checks for this sector	No	50
	Other (chemical industry) – CO_2	Continue the work to estimate the amount of liquid fuels used as feedstocks for hydrogen production and report associated emissions in other (chemical industry)	No	51
	Iron and steel production – CO_2	Expand on the discussion of the IEF trend in the NIR, including the information provided to the ERT during the review	No	52
Agriculture	General	Provide sufficient information on EFs to improve transparency	No	55
		Improve information in the NIR on data used to estimate emissions	Yes	56

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation ?*	*Paragraph cross-references*
	Enteric fermentation – CH_4	Explain how the equation used in the calculations was developed	No	57
		Describe the detailed plan and the progress on the implementation of the plan, and collect data and information about the EF needed to implement a tier 2 methodology	No	58
		Show all EFs in tabular format, and provide detailed information that explains the reasons for using the Swiss EF for poultry	No	59
	Manure management – CH_4	Explain the estimation method for other cattle and buffalo in detail	No	60
		Provide all the EFs and parameters used for calculating N_2O emissions, for example in tabular format	No	61
		Provide information on CH_4 EFs and parameters used for cattle and sheep in the NIR	No	64
	Agricultural soils – N_2O	The ERT recommends that Greece document all AD used in calculate N_2O emissions from agricultural soils.	Yes	62
		Improve transparency by showing all equations, all factors and the N values of all AD applied to soils that are used in the estimations	No	62
LULUCF	General	Provide transparent information on how the annual land-use change matrices have been developed and report a complete set of annual land-use change matrices	Yes	67
		Provide verification of the AD for total forest land, land remaining forest land and lands converted to forest land, and use the data on total forest land reported to the FAO for the development of annual land-use change matrices, including assessment of areas of natural forest expansion	No	68
		Collect the necessary information and report the AD and emission/removal estimates for the above-mentioned pools in future annual submissions	No	70
		Provide detailed and transparent information on the uncertainty assessment for the LULUCF	Yes	72

Sector	*Category/cross-cutting issue*	*Recommendation*	*Reiteration of previous recommendation ?*	*Paragraph cross-references*
		sector		
Waste	QA/QC	Enhance QC procedures to prevent inconsistencies in future submissions	No	78
	Solid waste disposal on land – CH_4	Enhance QC procedures to prevent inconsistencies in future submissions	No	79
	Wastewater handling – CH_4	Include all important parameters (especially MCF) for all types of treatment in the NIR to further increase the transparency of its reporting	No	80
		Reporting CH_4 recovery either as providing an estimate of the amount of recovered CH_4, or by replacing the currently used notation key with "NE"	No	81
		Increase the consistency of information between the NIR and the CRF tables	No	82
Commitment period reserve		Report accurate information on the commitment period reserve	Yes	101
National system		Proceed with the update of legislative documents that regulate the functioning of the national system and report on the outcomes in its annual submissions in accordance with decision 15/CMP.1, annex, chapter I.F	No	105

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, FAO = Food and Agriculture Organization of the United Nations, GHG = greenhouse gas, IEF = implied emission factor, LPG = liquefied petroleum gas, LULUCF = land use, land-use change and forestry, MCF = methane conversion factor, NIR = national inventory report, QA/QC = quality assurance/quality control.

IV. Questions of implementation

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

Annex I

Information to be included in the compilation and accounting database

Table 10
Information to be included in the compilation and accounting database in t CO_2 eq for 2012, including the commitment period reserve

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	575 225 094	554 970 299		554 970 299
Annex A emissions for 2012				
CO_2	90 472 386			90 472 386
CH_4	9 698 196	9 706 235		9 706 235
N_2O	6 810 336	6 810 884		6 810 884
HFCs	3 889 046			3 889 046
PFCs	110 395			110 395
SF_6	5 114			5 114
Total Annex A sources[c]	**110 985 473**	**110 994 060**		**110 994 060**
Activities under Article 3, paragraph 3, for 2012				
3.3 Afforestation and reforestation on non-harvested land for 2012	–145 173	–144 392		–144 392
3.3 Afforestation and reforestation on harvested land for 2012	NA			NA
3.3 Deforestation for 2012	100 258			100 258
Activities under Article 3, paragraph 4, for 2012[d]				
3.4 Forest management for 2012	–1 834 406	–1 756 401		–1 756 401
3.4 Cropland management for 2012				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2012				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2012				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, NA = not applicable.
[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.
[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 11
Information to be included in the compilation and accounting database in t CO_2 eq for 2011

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2011				
CO_2	94 250 734			94 250 734
CH_4	9 775 311	9 783 959		9 783 959
N_2O	7 208 395	7 208 944		7 208 944
HFCs	3 410 133			3 410 133
PFCs	78 344			78 344
SF_6	5 150			5 150
Total Annex A sources[c]	**114 728 068**	**114 737 264**		**114 737 264**
Activities under Article 3, paragraph 3, for 2011				
3.3 Afforestation and reforestation on non-harvested land for 2011	–143 914	–143 703		–143 703
3.3 Afforestation and reforestation on harvested land for 2011	NA			NA
3.3 Deforestation for 2011	45 656			45 656
Activities under Article 3, paragraph 4, for 2011[d]				
3.4 Forest management for 2011	–1 839 264	–1 818 167		–1 818 167
3.4 Cropland management for 2011				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2011				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2011				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, NA = not applicable.

[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 12
Information to be included in the compilation and accounting database in t CO_2 eq for 2010

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2010				
CO_2	96 758 267			96 758 267
CH_4	9 891 572	9 899 124		9 899 124
N_2O	7 512 853	7 513 365		7 513 365
HFCs	3 603 275			3 603 275
PFCs	105 545			105 545
SF_6	6 142			6 142
Total Annex A sources[c]	**117 877 654**	**117 885 718**		**117 885 718**
Activities under Article 3, paragraph 3, for 2010				
3.3 Afforestation and reforestation on non-harvested land for 2010	–166 098	–165 605		–165 605
3.3 Afforestation and reforestation on harvested land for 2010	NA			NA
3.3 Deforestation for 2010	43 872			43 872
Activities under Article 3, paragraph 4, for 2010[d]				
3.4 Forest management for 2010	–1 836 860	–1 787 596		–1 787 596
3.4 Cropland management for 2010				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2010				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2010				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, NA = not applicable.

[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 13
Information to be included in the compilation and accounting database in t CO_2 eq for 2009

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2009				
CO_2	103 712 600			103 712 600
CH_4	9 788 538	9 797 429		9 797 429
N_2O	7 190 605	7 191 216		7 191 216
HFCs	3 338 700			3 338 700
PFCs	74 279			74 279
SF_6	5 258			5 258
Total Annex A sources[c]	**124 109 981**	**124 119 483**		**124 119 483**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009	–131 291	–130 129		–130 129
3.3 Afforestation and reforestation on harvested land for 2009	NA			NA
3.3 Deforestation for 2009	47 954			47 954
Activities under Article 3, paragraph 4, for 2009[d]				
3.4 Forest management for 2009	–1 831 157	–1 715 088		–1 715 088
3.4 Cropland management for 2009				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2009				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, NA = not applicable.

[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 14
Information to be included in the compilation and accounting database in t CO_2 eq for 2008

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2008				
CO_2	110 005 376			110 005 376
CH_4	10 056 100	10 064 991		10 064 991
N_2O	7 645 276	7 645 888		7 645 888
HFCs	2 950 249			2 950 249
PFCs	93 534			93 534
SF_6	7 529			7 529
Total Annex A sources[c]	**130 758 063**	**130 767 566**		**130 767 566**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008	–109 635	–108 569		–108 569
3.3 Afforestation and reforestation on harvested land for 2008	NA			NA
3.3 Deforestation for 2008	52 625			52 625
Activities under Article 3, paragraph 4, for 2008[d]				
3.4 Forest management for 2008	–1 831 977	–1 725 513		–1 725 513
3.4 Cropland management for 2008				
3.4 Cropland management for the base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for the base year				
3.4 Revegetation for 2008				
3.4 Revegetation for the base year				

Abbreviations: Annex A sources = source categories included in Annex A to the Kyoto Protocol, NA = not applicable.

[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] The values for "Total Annex A sources" in the columns "As reported", "Revised estimates" and "Final" may not equal the sum of the values for the gases in those columns owing to rounding.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Annex II

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 for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks 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 Greece 2014. Available at <http://unfccc.int/resource/docs/2014/asr/grc.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2014. Available at <http://unfccc.int/resource/webdocs/sai/2014.pdf>.

FCCC/ARR/2013/GRC. Report of the individual review of the annual submission of Greece submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/grc.pdf>.

Standard independent assessment report template, parts 1 and 2. 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 Mr. Ioannis Sempos (National Technical University of Athens), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Greece:

Cambra-López, M., P. García Rebollar, F. Estellés and A. Torres (2008). Estimation of emissions from ruminants in Spain: the methane conversion factor. Archivos de Zootécnia <http://www.uco.es/organiza/servicios/publica/az/php/az.php?idioma_global=0&revisiones=143&codigo=1640>.

Global Forest Resources Assessment. 2010. Country report. Greece. FRA2010/079. Rome. 30 p. Available at <http://www.fao.org/docrep/013/al515E/al515E.pdf>.

Structure and Operation of the National Greenhouse Gas Inventory System – Roles and Responsibilities. Circular of the Ministry for the Environment, Physical Planning and Public Works of the Hellenic Republic Ref. no. 918, April 21, 2008.

[1] Reproduced as received from the Party.

Annex III

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
AWMS	animal waste management system
CER	certified emission reduction unit
CH_4	methane
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
EF	emission factor
ERT	expert review team
EU	European Union
EU ETS	European Union Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
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
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MCF	methane conversion factor
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
RMU	removal unit
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