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**Report of the individual review of the inventory submission
of Cyprus submitted in 2013***

* In the symbol for this document, 2013 refers to the year in which the inventory was submitted, and not to the year of publication.

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I. Introduction and summary

1. This report covers the review of the 2013 inventory submission of Cyprus, coordinated by the UNFCCC secretariat, in accordance with decision 19/CP.8. The review took place from 23 to 28 September 2013 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Paul Filliger (Switzerland) and Mr. Tomas Gustafsson (Sweden); energy – Ms. Kristien Aernouts (Belgium), Mr. Alexey Vladimirovich Cherednichenko (Kazakhstan), Mr. Christo Christov (Bulgaria) and Ms. Lea Kai (Lebanon); industrial processes and solvent and other product use – Mr. David Kuntze (Germany) and Mr. Jacek Skoskiewicz (Poland); agriculture – Mr. Daniel Bretscher (Switzerland), Mr. Nguyen Mong Cuong (Viet Nam) and Mr. Thomas Wirth (United States of America); land use, land-use change and forestry (LULUCF) – Mr. Agustín José Inthamoussu (Uruguay) and Ms. Sekai Ngarize (United Kingdom of Great Britain and Northern Ireland); and waste – Ms. Juliana Bempah (Ghana) and Ms. Kaatje Jespers (Belgium). Ms. Bempah and Mr. Gustafsson were the lead reviewers. The review was coordinated by Mr. Tomoyuki Aizawa (UNFCCC secretariat).

2. In accordance with the “Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention” (hereinafter referred to as the UNFCCC review guidelines), a draft version of this report was communicated to the Government of Cyprus, which made no comment on it. All encouragements and recommendations in this report are for the next inventory submission, unless otherwise specified.

3. In 2011, the main greenhouse gas (GHG) in Cyprus was carbon dioxide (CO₂), accounting for 83.8 per cent of total GHG emissions¹ expressed in CO₂ equivalent (CO₂ eq), followed by methane (CH₄) (9.8 per cent) and nitrous oxide (N₂O) (5.0 per cent). Hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆) collectively accounted for 1.4 per cent of the overall GHG emissions in the country. Perfluorocarbons (PFCs) have been reported as not occurring (“NO”) and not applicable (“NA”). The energy sector accounted for 78.0 per cent of total GHG emissions, followed by the agriculture sector (8.0 per cent), the industrial processes sector (7.6 per cent) and the waste sector (6.4 per cent). Total GHG emissions amounted to 9,154.37 Gg CO₂ eq and increased by 50.3 per cent between the base year and 2011. The expert review team (ERT) concludes that the description in the national inventory report (NIR) of the trends for the different gases and sectors is reasonable.

4. Tables 1 and 2 show GHG emissions under the Convention, by gas and by sector, respectively. In table 1, CO₂, CH₄ and N₂O emissions do not include emissions and removals from the LULUCF sector.

¹ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ equivalent excluding LULUCF, unless otherwise specified.

Table 1
Greenhouse gas emissions by gas, 1990 to 2011

Greenhouse gas	Gg CO ₂ eq								Change 1990–2011 (%)
	1990	1995	2000	2005	2008	2009	2010	2011	
CO ₂	4 921.57	6 088.18	7 143.54	7 856.87	8 629.93	8 351.76	7 991.56	7 672.29	55.9
CH ₄	719.40	867.53	927.20	959.82	965.68	975.78	945.21	897.55	24.8
N ₂ O	449.87	509.61	483.74	472.23	443.59	435.60	450.38	457.90	1.8
HFCs	NA, NO	NA, NO	19.33	22.18	26.29	40.35	56.40	126.63	NA
PFCs	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA
SF ₆	NA, NO	NA, NO	0.00	0.00	0.00	0.00	0.00	0.00	NA

Abbreviations: NA = not applicable, NO = not occurring.

Table 2
Greenhouse gas emissions by sector, 1990 to 2011

Sector	Gg CO ₂ eq								Change 1990–2011 (%)
	1990	1995	2000	2005	2008	2009	2010	2011	
Energy	4 213.76	5 307.55	6 360.55	6 994.82	7 771.17	7 665.30	7 440.55	7 137.02	69.4
Industrial processes	728.15	804.85	830.56	915.20	920.60	762.59	641.94	696.98	–4.3
Solvent and other product use	NE	NE	NE	NE	NE	NE	NE	NE	NA
Agriculture	678.91	779.12	743.58	738.15	707.82	698.25	722.14	729.94	7.5
LULUCF	–138.90	–148.81	–150.30	–174.19	–172.82	–174.53	–165.53	–76.47	–44.9
Waste	470.03	573.79	639.13	662.93	665.90	677.36	638.91	590.44	25.6
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	5 951.95	7 316.51	8 423.51	9 136.91	9 892.67	9 628.96	9 278.02	9 077.90	52.5
Total (without LULUCF)	6 090.85	7 465.32	8 573.82	9 311.10	10 065.49	9 803.49	9 443.54	9 154.37	50.3

Abbreviations: LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

5. The 2013 annual inventory submission was submitted on 11 April 2013; it contains a complete set of common reporting format (CRF) tables for the period 1990–2011 and an NIR. The inventory submission was submitted in accordance with the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories” (hereinafter referred to as the UNFCCC reporting guidelines).

6. The full list of materials used during the review is provided in annex I to this report.

2. Overall assessment of the inventory

7. Table 3 contains the ERT’s overall assessment of the inventory submission of Cyprus. For recommendations for improvements related to cross-cutting issues for specific categories, please see the paragraphs cross-referenced in the table.

Table 3

The expert review team’s overall assessment of the inventory submission

<i>General findings and recommendations</i>		
The expert review team’s (ERT’s) findings on completeness of the 2013 inventory submission		
Non land use, land-use change and forestry (LULUCF) ^a	Not complete	<p>Mandatory: Not estimated (“NE”) is reported for: CO₂, CH₄ and N₂O emissions from biomass fuel combustion in the commercial/institutional (1990–2006), residential (1990–2005) and agriculture/forestry/fisheries (1990–2011) subcategories; CO₂ emissions from oil transport; CO₂ and CH₄ emissions from transport of oil and venting (oil); CO₂ emissions from limestone and dolomite use; HFC-227ea emissions from fire extinguishers; CH₄ emissions from enteric fermentation of mules and asses; and N₂O emissions from cultivation of histosols</p> <p>For further information, see paragraph 9 below</p> <hr/> <p>Non-mandatory: “NE” is reported for: CO₂ and CH₄ emissions from distribution of oil products; CO₂ emissions from feedstock use of lubricants and bitumen; CO₂, CH₄ and N₂O emissions from lubricants in marine bunkers; CH₄ and N₂O emissions from other sectors (industrial processes and ceramic production); CO₂ emissions from asphalt roofing; CO₂ emissions from road paving with asphalt; CO₂ emissions from food and drink; CO₂ and N₂O emissions from the solvent and other product use sector; indirect CH₄ emissions from agricultural soils; and CO₂ emissions</p>

<i>General findings and recommendations</i>		
LULUCF ^a	Not complete	<p>from managed and unmanaged waste disposal on land (shallow)</p> <p>Mandatory: “NE” is reported for carbon stock change from biomass losses and soils from forest land remaining forest land. The common reporting format (CRF) tables are left blank for land converted to forest land, cropland, grassland, wetlands, settlements and other land. The expert review team (ERT) noted that a zero value is used in many cases and strongly recommends that it be replaced by a notation key. In the case of LULUCF, most zeros should be replaced by “NE”. The ERT recommends that Cyprus use notation keys instead of leaving empty cells and/or reporting zeros</p> <p>For further information, see paragraph 10 below</p> <hr/> <p>Non-mandatory: The following categories are not reported: wetlands remaining wetlands, settlements remaining settlements, other land remaining other land and non-CO₂ emissions from drainage of soils and wetlands (see paras. 79, 80 and 82 below)</p>
The ERT’s findings on recalculations and time-series consistency in the 2013 inventory submission	<p>Recalculations: not applicable</p> <p>Time-series consistency: not consistent</p>	<p>This is the first inventory submission of Cyprus to the UNFCCC. Recalculations are reported, but they refer to a submission to the European Union (EU), which is not available through the UNFCCC</p> <p>In the energy sector the time series is not consistent, owing to the use of different data sources for before and after 2005, without appropriate explanations for this being provided (see para. 18 below). For the LULUCF sector time-series consistency cannot be assessed completely owing to the very incomplete reporting</p> <p>Further category-specific recommendations can be found in paragraphs 29, 30, 31, 36, 40, 44, 45, 72 and 77 below</p>
The ERT’s findings on verification and quality assurance/quality control (QA/QC) procedures in the 2013 inventory submission	Sufficient	<p>Cyprus has implemented a QA/QC plan. The ERT recommends that Cyprus work further on the implementation of the QA/QC plan and on providing sufficient personnel capacity for QA/QC procedures. The ERT recommends that Cyprus provide more detail in its national inventory report (NIR) on the QA/QC procedures carried out and review the inventory (sector by sector) using independent national experts after completing the inventory</p> <p>Category-specific recommendations can be found in paragraphs 39, 57, 58, 66, 78 and 94 below</p>

General findings and recommendations

The ERT's findings on the transparency of the 2013 inventory submission	Not sufficient	<p>In view of the fact that this is the first inventory submission of Cyprus, the NIR is already of good quality, but the transparency regarding, for example, background information on the methodologies used, the rationale behind the selection of emission factors and the documentation of activity data concerning all sectors must be improved. The ERT recommends that the Party improve the transparency of its reporting on all sectors</p> <p>Category-specific recommendations can be found in paragraphs 56, 58, 63, 70, 73, 76, 83, 86, 87, 90, 93 and 95 below</p>
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^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*).

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

Inventory planning

8. The NIR described the institutional arrangements for the preparation of the inventory. The Ministry of Agriculture, Natural Resources and Environment (MANRE) has overall responsibility for the national inventory. Other ministries (Ministry of Finance (Statistical Service); Ministry of Energy, Commerce, Industry and Tourism (Energy Service); Ministry of Labour and Social Insurance (Department of Labour Inspection); and Ministry of the Interior (Waste Management)) as well as private agencies (importers of fluorinated gases (F-gases), the Electricity Authority of Cyprus and cement and ceramic manufacturers) are also involved in the preparation of the inventory. There is no formal legal framework available that defines the roles and responsibilities and the cooperation between MANRE and the other ministries and agencies. However, there is an informal network of staff between MANRE and all involved ministries and agencies, which is documented in the NIR. The ERT encourages Cyprus to formalize the data exchange in the future (e.g. through agreements/memorandums of understanding).

9. In addition, Cyprus has no available data for several categories (see table 3). The ERT recommends that Cyprus give priority to identifying and collaborating with relevant institutions or organizations to collect the necessary activity data (AD), particularly for categories for which methods and emission factors (EFs) are provided in the Intergovernmental Panel on Climate Change (IPCC) guidelines, in order to complete the inventory.

10. The institutional arrangements and basic infrastructure for reporting on LULUCF have not yet been developed and the necessary data are not yet available. The ERT strongly recommends that Cyprus include the relevant ministries and agencies in the institutional arrangements for inventory preparation, in order to make complete reporting on LULUCF possible.

11. Concerning geographical coverage, the NIR states that the inventory only covers the areas of Cyprus that are under the effective control of the Government of Cyprus.

Inventory preparation

12. Table 4 contains the ERT's assessment of Cyprus' inventory preparation process.

Table 4

Assessment of inventory preparation by Cyprus

<i>General findings and recommendations</i>		
<i>Key category analysis</i>		
Was the key category analysis performed in accordance with the Intergovernmental Panel on Climate Change (IPCC) <i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i> (hereinafter referred to as the IPCC good practice guidance) and the IPCC <i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i> (hereinafter referred to as the IPCC good practice guidance for LULUCF)?	Yes	The expert review team (ERT) encourages Cyprus to present the key category analysis for 1990 also in chapter 1.5 of the national inventory report (NIR) (not only in the annex)
Approach followed?	Tier 1	The ERT encourages Cyprus to develop a tier 2 approach, after improving the completeness of the inventory
Were additional key categories identified using a qualitative approach?	No	
Does the Party use the key category analysis to prioritize inventory improvements?	Yes	
Are there any major changes to the key category analysis in the latest submission?	Not applicable	First inventory submission
<i>Assessment of uncertainty analysis</i>		
Approach followed?	Tier 1	The ERT encourages Cyprus to develop a tier 2 approach, after improving the completeness of the inventory
Was the uncertainty analysis carried out consistent with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF?	No	The calculation of total level and trend uncertainty was not correct. In response to a question from the ERT, Cyprus sent a corrected uncertainty estimate. The ERT recommends that Cyprus include the revised uncertainty analysis in the NIR and encourages the Party to report the trend uncertainty in chapter 1.7 of the NIR (not only in the annex) No uncertainty analysis was carried out for LULUCF, owing to the incomplete LULUCF reporting. The ERT recommends that the Party carry out an uncertainty analysis for LULUCF, after completing its LULUCF reporting (see para. 19 below)
Quantitative uncertainty (including LULUCF)		Not reported, owing to the incomplete LULUCF reporting

General findings and recommendations

Quantitative uncertainty (excluding LULUCF)	Level = 8.3%	
	Trend = 8.9%	
Use of notation keys	Incomplete	<p>As documented in the annual status report for Cyprus,^a information gaps occur in many of the common reporting format (CRF) tables, which should be filled with notation keys. The extensive occurrence of blank cells in relation to the LULUCF sector is noted in table 3, but blank cells also appear in relation to the industrial processes sector (e.g. for fluorinated gases). The ERT recommends that Cyprus use notation keys in the CRF tables instead of leaving empty cells and/or reporting zeros</p> <p>The ERT noted that information on the notation keys has not been filled in completely in CRF table 9(a). Specifically, an explanation is not provided for all cases of not estimated being reported (e.g. for indirect emissions from agricultural soils) and for sources reported as included elsewhere (IE), and the allocation of emissions used by the Party is reported in the column for “allocation per IPCC Guidelines”. The ERT recommends that Cyprus provide relevant information in the explanation column of the CRF tables and report the allocation used by the Party in the correct column, in order to improve the transparency of its reporting</p>

Abbreviation: LULUCF = land use, land-use change and forestry.

^a Available at <<http://unfccc.int/resource/docs/2013/asr/cyp.pdf>>.

Inventory management

13. Cyprus has a centralized archiving system, which includes the archiving of disaggregated EFs and AD, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal documentation on quality assurance/quality control (QA/QC) procedures, external and internal reviews, and documentation on annual key categories and planned inventory improvements. MANRE manages the inventory preparation as well as the archiving using an Excel-based system.

4. Follow-up to previous reviews

14. This is not applicable because this is the first inventory submission of Cyprus.

5. Areas for further improvement identified by the expert review team

15. During the review, the ERT identified a number of areas for improvement, including some related to specific categories. These are listed in the relevant chapters of this report and in table 7.

16. Taking into consideration all of the recommendations provided in this report, the ERT believes that the following three should be given priority for the future development of the GHG inventory of Cyprus:

- (a) Improve the completeness of the inventory;
- (b) Design the institutional arrangements in order to obtain input data for the LULUCF sector;
- (c) Increase the transparency of the NIR for all sectors.

B. Energy

1. Sector overview

17. The energy sector is the main sector in the GHG inventory of Cyprus. In 2011, emissions from the energy sector amounted to 7,137.02 Gg CO₂ eq, or 78.0 per cent of total GHG emissions. Since 1990, emissions have increased by 69.4 per cent. The key drivers for the rise in emissions are the growth of the gross domestic product since 1990, fluctuations in tourism activities, an increase in the number of vehicles and an increase in transport activity. Within the sector, 52.2 per cent of the emissions were from energy industries, followed by 31.5 per cent from transport, 8.9 per cent from other sectors and 7.2 per cent from manufacturing industries and construction. The remaining 0.3 per cent were from the category other (fuel combustion). Emissions are produced exclusively from fuel combustion activities. Fugitive emissions only occurred until 2004, which is when refining activities were terminated in Cyprus.

18. The ERT noted that Cyprus did not report transparently on how it ensured time-series consistency in reconciling the two different data sets used for calculating the emissions from the energy sector (the energy balance (for 1990–2004) and European Union Emissions Trading System (EU ETS) data (for 2005 onward)). Specifically, the default EFs for CO₂ from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) were used to calculate emissions for the period 1990–2004, while the EU ETS reporting methodology and country- and plant-specific EFs were used for the period 2005–2011. The ERT recommends that Cyprus improve the transparency of its reporting on how the emissions are estimated by including information on its efforts to reconcile the energy balance and EU ETS data, as well as additional information on the use of EU ETS data and an explanation of how it ensures the time-series consistency of the emission estimates.

19. A quantitative sectoral uncertainty assessment was performed for the energy sector as a whole, instead of assessing each category for CO₂, CH₄ and N₂O. The ERT encourages Cyprus to make efforts to perform a qualitative uncertainty assessment for each category, in order to better reflect its national circumstances.

20. The NIR states that a comparison with the results from COPERT IV was undertaken for the emissions from the transport sector. However, the results of this verification exercise were not presented in the NIR, and actions undertaken when values did not agree were not explained. The ERT encourages Cyprus to provide more detail on the results of the verification exercise.

2. Reference and sectoral approaches

21. 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 22–28 below.

Table 5

Review of reference and sectoral approaches

		<i>Paragraph cross references</i>
Difference between the reference approach and the sectoral approach	Energy consumption: 94.68 PJ, 100% CO ₂ emissions: 182.94 Gg CO ₂ eq, –2.58%	24
Are differences between the reference approach and the sectoral approach adequately explained in the NIR and the CRF tables?	No	22
Are differences with international statistics adequately explained?	No	25
Is reporting of bunker fuels in accordance with the UNFCCC reporting guidelines?	Yes	26 and 27
Is reporting of feedstocks and non-energy use of fuels in accordance with the UNFCCC reporting guidelines?	Yes	28

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

22. Explanations for the fluctuations in the difference between the two approaches over the years are only provided in the NIR. The ERT encourages Cyprus to also provide explanations for the differences in values in the documentation box of CRF table 1.A(c) for all reported years.

23. The difference between the reference and sectoral approaches for every year in the period 1990–2011 ranges from –4.5 per cent to 15.2 per cent. With regard to other fuels, the ERT noted a significant difference between the two approaches for the years 2007–2010 (ranging from 129.42 per cent to 622.90 per cent). The ERT encourages Cyprus to further investigate these differences and include the results, and if possible the corrections, in the NIR.

24. Apparent energy consumption (excluding non-energy use and feedstocks) has not been reported in the CRF tables for all years, resulting in a difference of 100 per cent in the energy consumption between the reference approach and the sectoral approach. The ERT recommends that Cyprus report apparent energy consumption in CRF table 1.A(c).

25. The ERT noted differences in the import values for petroleum products between the International Energy Agency data and the values reported in CRF table 1.A(b) for all years. The ERT recommends that Cyprus provide an explanation for these differences in the NIR.

International bunker fuels

26. GHG emissions from fuel combustion in both international bunkers and civil aviation were reported under international bunker fuels (chapter 3.2.2 of the NIR). In response to a question raised by the ERT during the review on the need for differentiation between domestic and international aviation, Cyprus indicated that efforts are currently being made to collect separate AD for civil aviation activities as part of its inventory improvement plan. The ERT commends Cyprus for its efforts and recommends that Cyprus report the related emissions under civil aviation.

27. GHG emissions from fuel combustion in domestic navigation and marine bunkers were reported under international bunker fuels (chapter 3.2.2 of the NIR). In response to a question raised by the ERT during the review on the need for differentiation between domestic and international navigation (especially because Cyprus is an island), Cyprus indicated that no efforts had been taken to achieve such differentiation. The ERT recommends that Cyprus collect separate AD for international navigation and report the related emissions under marine bunkers.

Feedstocks and non-energy use of fuels

28. No problems were identified except for the reporting of associated CO₂ emissions from lubricants and bitumen as not estimated (“NE”) in CRF table 1.A(d) for all years (see table 3). The ERT encourages Cyprus to investigate the consumption of those fuels and, if necessary, estimate and report the associated GHG emissions. If emissions are determined to be not occurring, then the ERT recommends that the Party change the notation key used to “NO”.

3. Key categoriesStationary combustion: liquid fuels – CO₂, CH₄ and N₂O²

29. The ERT noted that for between 1990 and 2005 Cyprus reported CO₂, CH₄ and N₂O emissions from commercial/institutional and residential together under residential. For 2006 onward, emissions for those subcategories were reported separately. The ERT encourages Cyprus to estimate emissions separately for the commercial, institutional and residential sectors for all reported years.

30. Cyprus reported in the NIR (chapters 3.2.6.2 and 3.2.7.2) using different carbon content and oxidation factors for calculating CO₂ emissions from stationary combustion for different periods of the time series. Default values based on the Revised 1996 IPCC Guidelines were used for the 1990–2004 period, while country- and plant-specific values were used for the 2005–2011 period. The ERT commends Cyprus for using higher-tier EFs for calculating emissions for these categories for the later years. In line with the IPCC good practice guidance, the ERT recommends that Cyprus use country- and/or plant-specific EFs when available for the earlier years of the time series, especially because this is a key category.

31. In the NIR (chapters 3.2.7.2 and 3.2.9), Cyprus reported different sources for the AD used for calculating CO₂ emissions from the manufacturing industries and construction sector and other sectors, which has led to significant changes in the emission trend for 1994–2011 (figures 3.5 and 3.7 in the NIR). In response to a question raised by the ERT

² Not all emissions related to all gases under this category are key categories, particularly CH₄ and N₂O emissions. However, since the calculation procedures for issues related to this category are discussed as a whole, the individual gases are not assessed in separate sections.

during the review regarding the emission trend, Cyprus explained that a different fuel allocation was used for after 2005 as a result of the availability of new data. The ERT commends Cyprus for using disaggregated data for calculating emissions for these categories and recommends that Cyprus conduct research to determine whether the fuel allocation used for 2005 onward is reflective of the situation in previous years of the time series.

32. The ERT identified a change in the CO₂ implied emission factor (IEF) in public electricity and heat production, which decreased between 2010 and 2011. The 2011 value (77.51 t/TJ) is 0.7 per cent lower than the 2010 value (78.05 t/TJ). Additionally, the following inter-annual changes in the IEF were identified: 2005–2006, +3.0 per cent; 2007–2008, –0.5 per cent; 2008–2009, –1.0 per cent; and 2009–2010, +0.4 per cent. The ERT recommends that Cyprus further investigate and explain the reasons behind the fluctuation in the IEF.

33. Emissions from manufacturing industries and construction have been reported only under other (manufacturing industries and construction). There are two subcategories reported under other (manufacturing industries and construction), namely non-metallic minerals and other. Emissions from cement industry are reported under the subcategory non-metallic minerals for 1990–2011. The ERT commends Cyprus for its current efforts to collect fuel consumption data for all industrial activities. In response to a question raised by the ERT during the review regarding the disaggregation of data, Cyprus explained that it is currently trying to collect data from all industries. Since this is a key category, the ERT recommends that Cyprus report disaggregated AD in the NIR in line with the IPCC good practice guidance.

34. Cyprus reported an amount of liquid fuels under stationary (other) (fuel combustion) for the years 2006–2011 (259.98 TJ in 2011) with no indication of the type of the fuel. The ERT recommends that Cyprus further investigate the nature and use of this liquid fuel and report it in the NIR.

35. In chapters 1.4.1 and 3.1.2 of the NIR, Cyprus indicated that it used plant-specific data, while it indicated the use of country-specific data in the NIR. The ERT recommends that Cyprus correct this inconsistency between the NIR and the CRF tables.

Stationary combustion: solid fuels – CO₂

36. Cyprus used a tier 1 methodology for the calculation of CO₂ emissions from the combustion of solid fuels, with the IPCC default carbon content, net calorific value and oxidation factor for the period 1990–2004. The ERT noted that Cyprus used plant-specific net calorific values, oxidation factors and tier 2 EFs to calculate the CO₂ emissions for the period 2005–2011, which is in line with the IPCC good practice guidance. Given the comprehensive information available for 2005–2011, the ERT is of the view that Cyprus is in a position to generate national carbon content values and hence use a higher-tier method for estimating emissions for this key category for the 1990–2004 period. The ERT recommends that Cyprus make efforts to generate country-specific CO₂ EFs and use a higher-tier methodology for the whole reporting period, in order to ensure time-series consistency.

Road transportation: liquid fuels – CO₂, CH₄ and N₂O

37. Cyprus used the COPERT IV model to compare the results with the emissions from road transportation estimated using the IPCC default method. The ERT commends the Party for its efforts to use more specific tools and invites the Party to share the results of this comparison in its NIR. In addition, the ERT encourages Cyprus to use the input data from COPERT IV, such as fleet characterization, vehicle technology mileage and air

pollution control technologies, to establish country-specific EFs for estimating emissions from road transportation that are in line with the IPCC good practice guidance.

38. The ERT noted that the CO₂ IEFs for gasoline (68.61 t/TJ) and diesel oil (73.33 t/TJ) used for road transportation are lower than the IPCC default EFs for all years. In response to a question raised by the ERT during the review on this issue, Cyprus reported using the carbon EFs for gasoline (68.61 t/TJ) and diesel oil (73.33 t/TJ) under road transportation. The ERT recommends that Cyprus provide the reason why the EFs applied deviated from the IPCC default EFs in the NIR.

4. Non-key categories

Stationary combustion: biomass – CH₄ and N₂O

39. The ERT noted that there is an inconsistency between the information on solid biomass consumption for the residential sector for 2001 reported in table 3.22 of the NIR (2,300.00 TJ) and that in the CRF tables (229.99 TJ). The ERT recommends that Cyprus correct this inconsistency and ensure the consistency of its reporting, especially between the NIR and the CRF tables, through tier 1 QC activities.

40. The ERT also noted that the value of biomass consumption for other sectors for 2011 (339.49 TJ) is higher than the previous years' average value (121.8 TJ for 2006–2010). Cyprus reported in the NIR (chapter 3.2.9.2) that this change can be attributed to the use of a different source of AD for 2010 and 2011. The ERT recommends that Cyprus further investigate the definition and boundaries of the AD and implement a QA/QC procedure in order to ensure time-series consistency. The ERT encourages Cyprus to report the results in its NIR and, if appropriate, correct the value.

Road transportation: biomass – CH₄ and N₂O

41. Cyprus reported emissions from biomass fuel combustion in transport as “NA” and “NO” for 1990–2005, while it reported only “NO” under road transportation for the same years. The ERT recommends that Cyprus correct these inconsistencies and ensure the consistency of its reporting through tier 1 QC activities.

C. Industrial processes and solvent and other product use

1. Sector overview

42. In 2011, emissions from the industrial processes sector amounted to 696.98 Gg CO₂ eq, or 7.6 per cent of total GHG emissions, while emissions from the solvent and other product use sector are reported as “NE”. Since 1990, emissions have decreased by 4.3 per cent in the industrial processes sector. The key driver for the fall in emissions in the industrial processes sector is the reduction in cement production. Within the industrial processes sector, 78.3 per cent of the emissions were from cement production, followed by 18.0 per cent from refrigeration and air conditioning, 2.5 per cent from other (mineral products and ceramic production) and 1.0 per cent from lime production. HFC emissions from foam blowing accounted for 0.2 per cent. The remaining 0.0003 per cent were from HFC emissions from aerosols/metered dose inhalers and SF₆ emissions from electrical equipment.

43. The ERT noted that the reporting on the industrial processes sector is incomplete because many potential sources of emissions were not included. In response to the question raised by the ERT during the review on this issue, the Party provided information on planned improvements that could significantly increase the number of categories reported.

The ERT recommends that Cyprus conduct this improvement plan and report emission estimates for those categories.

2. Key categories

Cement production – CO₂

44. Cyprus reported in chapter 4.2 of its NIR that emissions from cement production were estimated using three different data sources for AD: national statistics for 1990–1996, data submitted by installations for the National Allocation Plan for 1997–2005 and verified EU ETS reports for 2005–2011. There are some fluctuations in the EFs applied: for example, the 2005 CO₂ IEF value (0.5468 t/t) is 2.2 per cent higher than the 2004 value (0.5352 t/t). Additionally, the following inter-annual changes have been identified as significant: 1999–2000, –0.3 per cent; 2005–2006, –2.6 per cent; 2006–2007, 0.7 per cent; 2008–2009, –0.6 per cent; and 2010–2011, –1.1 per cent. The ERT asked Cyprus to explain how it ensures time-series consistency and that the emission estimates provided by installations can be incorporated in the inventory in line with the IPCC good practice guidance. In response to the question raised by the ERT during the review, Cyprus explained that the data submitted by installations for the National Allocation Plan (1997–2005) and the EU ETS reports (2005–2011) are verified on the basis of European Union regulations that use IPCC methodologies. The latest European Union regulation in force is Commission Regulation No. 601/2012. Regarding emissions, Cyprus explained that it considered the IEF for the earliest year for which verified data are available (1997) to be more realistic and more consistent to use for the years before 1997. Regarding the AD used for 1997–2011, it considered using verified data to be more accurate. For the earlier years of the time series, Cyprus considered using the official statistics of the country to be more appropriate than data from any other source. Cyprus ensures consistency by confirming the data collected with the two cement-producing installations in Cyprus. The ERT considers the clarifications provided by Cyprus to be transparent and reliable.

Consumption of halocarbons and SE₆ – HFCs

45. Cyprus reported in its NIR (page 82) an estimate of HFC emissions from refrigeration and air-conditioning equipment for 2011 (126.35 Gg CO₂ eq) that is 129.14 per cent higher than that for 2010 (55.14 Gg CO₂ eq). Cyprus explained in its NIR that this is the result of the availability of additional data and including new emission categories in the inventory. The ERT asked how Cyprus ensured that the emission estimates for this category are consistent throughout the time series and whether previous years' estimates were recalculated to include the new available data and sources. The ERT recommends that Cyprus keep up its efforts to ensure time-series consistency for this category by estimating emissions for historical years.

46. Cyprus reported in its NIR (chapter 4.5) that there is no manufacturing of refrigeration and air-conditioning equipment in Cyprus and that emissions are thus considered to be “NO”. In the CRF tables, emissions from manufacturing have been reported as “NA” or the cells were left blank for the entire time series, except for 2009 and 2011. For 2009, HFC-134a emissions were reported as included elsewhere (“IE”), which implies that some relevant activity occurs in Cyprus. However, no information on where those emissions were included was provided in CRF table 9(a). Emissions of HFC-125 from domestic and commercial refrigeration were reported for 2011, but not for the years prior to 2011. In response to questions raised by the ERT during the review regarding the time series, Cyprus explained that the notation key reported for 2009 and 2011 should be “NO”. The ERT recommends that Cyprus further examine whether emissions from manufacturing occur in the country and, as appropriate, report estimates or revise the use of the notation keys.

47. As mentioned in the NIR (chapter 4.5), there are data available on the disposal of refrigeration and air-conditioning equipment in Cyprus, but they are considered to be very uncertain. The ERT suggested that if the data are complete and consistent but associated with high uncertainty, this should be reported and that information on uncertainty should be included in an uncertainty analysis of the emissions inventory. In the CRF tables, emissions from the disposal of equipment have been reported as “NA” for the entire time series (except for 2009). For 2009, the notation key “IE” was also used for HFC-134a emissions, suggesting that activity occurs but is reported elsewhere, but no information was provided in CRF table 9(a) regarding where the emissions are reported. The ERT asked Cyprus to clarify this issue during the review. In response, Cyprus explained that data on disposal of equipment are incomplete and inconsistent, and that it will change the notation key used to “NE” for the entire time series. The ERT recommends that Cyprus further investigate whether there is additional information available on disposal of equipment and either report emissions or change the notation key used to “NE”.

48. Cyprus reported in its NIR (chapter 4.5) that there are large differences between its national statistics and the estimates provided by the ICF model. During the review, the ERT asked for a brief explanation of the reasons for those differences. In response, Cyprus explained that the specific model was developed for the European Commission to organize and present data on current and projected ozone-depleting substance/F-gas banks (for 2009–2050) across 27 European Union member States for key sectors and end-uses (i.e. foams, refrigeration/air conditioning and fire protection). Therefore, the model was not developed specifically for Cyprus and uses assumptions that may not be accurate for the country. As a result, there are differences between the national statistics and the estimates provided by the model. The estimates from the model are used in cases where national statistics are not available. The ERT recommends that Cyprus compare the estimates from the model with the estimates derived from the national statistics in terms of reliability in order to determine which method best represents national circumstances, and continue to identify opportunities to improve the estimates.

49. The ERT noted the assumptions used for estimating HFC emissions. For example, charge, annual leakage rate and the lifetime of the equipment were presented in table 4.14 of the NIR. Some of the assumptions are significantly lower than the ranges presented in tables 3.23 and 3.24 of the IPCC good practice guidance. The average charge of passenger cars, tractors and trailers reported by the Party is 450 g, while the IPCC good practice guidance suggests using an average of 800 g. As mentioned in the NIR, some of the assumptions were made on the basis of information provided by the Union of Refrigeration Technicians. The ERT asked Cyprus to provide it with that information or explain why the assumptions used better reflect national circumstances. In response to the question raised by the ERT during the review, Cyprus explained that the amount in question was used for charge after consulting various professional technicians. Cyprus also indicated that it will use the IPCC default charges for its next inventory submission. The ERT recommends that Cyprus collect documentation that supports the assumptions used or use default values for charge, annual leakage rate and the lifetime of the equipment from the IPCC good practice guidance.

50. No GHG emissions are reported under fire extinguishers in the CRF tables. HFC-227ea emissions are reported as “NE”. In response to a question raised by the ERT during the review, Cyprus explained that there are not enough data on the equipment to estimate emissions for this category, but that it expects the situation to improve. Cyprus is planning to improve its estimates of all F-gas emissions by the time that it submits its inventory in 2015. The ERT recommends that Cyprus continue its efforts to collect information on fire-extinguishing equipment and include the relevant emission estimates in its inventory submission.

51. Regarding potential HFC emissions, Cyprus reported in table 4.18 of its NIR that bulk imports amounted to 19.00 t HFC 134a in 1994 and 7.46 t in 1996, but no emissions from equipment operation were reported for the preceding years. It was unclear to the ERT how those gases were used. Estimates of actual emissions of HFC-134a are provided for 1999 onward. If imported gas were used as a charge, associated emissions from stock should be reported for at least as far back as 1995. The ERT asked Cyprus to clarify this issue during the review. In response, Cyprus explained that no data are available to describe how the bulk imports were used or to estimate the associated emissions, and that it will further investigate this in an attempt to find the consumers by the time of the preparation of its next NIR. The ERT recommends that Cyprus investigate the final use of HFC-134a bulk imports and revise the estimates of actual emissions, if necessary.

3. Non-key categories

Lime production – CO₂

52. Cyprus reported in its NIR (chapter 4.3) that AD for this category refer to data from reports submitted by installations to the Department of Labour Inspection in Cyprus. In response to a question raised by the ERT during the review, Cyprus explained that reports are submitted to the Department of Labour Inspection in accordance with the industrial emissions law, according to which all industrial installations are obliged to annually report certain activity parameters. The number of lime-producing installations in Cyprus is only around five and it is therefore easy to verify that the necessary data have been submitted. The ERT considers this explanation to be reliable and the reporting for this category to be complete.

Limestone and dolomite use – CO₂

53. In the CRF tables, Cyprus reported CO₂ emissions from limestone and dolomite use for 1990 to 2011 as “NE”. No information on this category is provided in its NIR. In response to a question raised by the ERT during the review, Cyprus explained that there is some dolomite use in Cyprus, but there is no information concerning the amounts consumed. Contact has been made with the relevant authorities to collect the necessary data. The ERT recommends that Cyprus improve the completeness of its reporting by including estimates of emissions from dolomite use.

Other (mineral products) – CO₂

54. Cyprus reported in its NIR (chapter 4.4.2) that estimates of emissions from ceramic production are mainly based on data from EU ETS reports. The ERT asked how Cyprus ensured that emission estimates provided by installations could be incorporated in the inventory in line with the IPCC good practice guidance. Cyprus responded that annual reports are prepared by the installations according to European Union regulations that are based on IPCC methodologies. The latest European Union regulation in force is Commission Regulation No. 601/2012. The reports are also verified by an accredited body that is in compliance with the relevant regulation. The ERT considers this explanation to be reliable and the reporting for this category to be complete and consistent.

D. Agriculture

1. Sector overview

55. In 2011, emissions from the agriculture sector amounted to 729.94 Gg CO₂ eq, or 8.0 per cent of total GHG emissions. Since 1990, emissions have increased by 7.5 per cent. In 2002, emissions peaked, with an increase of 26.1 per cent compared with in 1990. Since 2002, emissions have decreased by 14.7 per cent. The key drivers for the fall in emissions

in the period 2002–2011 are the reduction in the amount of nitrogen fertilizer applied to soils and the decrease in the livestock population (especially goats, swine and poultry). Within the sector, 37.4 per cent of emissions were from manure management, followed by 36.3 per cent from agricultural soils and 26.1 per cent from enteric fermentation. The remaining 0.1 per cent were from field burning of agricultural residues.

56. The NIR does not contain a detailed description of and justification for the selection of methods, EFs and AD. During the review, Cyprus provided the ERT with additional information on the AD and EFs used. The ERT considers some of the information to be insufficient and not detailed enough, for example the justification for the value reported for the fraction of agricultural residues actually burned in fields. The ERT recommends that Cyprus: (a) improve the reporting in the NIR by including information on the methods, EFs and AD used that it provided to the ERT during the review; and (b) provide a description of and justification for the value reported for the fraction of agricultural residues actually burned in fields. Furthermore, the ERT recommends that Cyprus apply higher-tier methods and collect country-specific data for all key categories in accordance with the decision tree in the IPCC good practice guidance.

57. The ERT found some inconsistencies between the information reported in the NIR and that in the CRF tables. For example, the values entered for nitrogen excretion (Nex) per head for horses and goats were 15.5 kg nitrogen (N)/head/year and 40 kg N/head/year, respectively, in table 6.10 of the NIR, while they were 40 kg N/head/year and 15.5 kg N/head/year, respectively, in CRF table 4.B(b). The notation key entered for prescribed burning of savannahs is “NO” in the NIR (chapter 6.1 and table 6.2), while it is reported as “NA” in CRF tables 4 and 4.E. The ERT recommends that Cyprus improve the consistency of the information between the CRF tables and the NIR, in order to increase the quality of its reporting.

58. The ERT also found that the NIR contained several incorrect sentences and/or words. For example, the NIR stated: “The emission factors for N excretion and N₂O-N/N...” (line 20, page 103); whereas the sentence should read: “Default values for N excretion per head of animal (kg/animal/year)...”. In addition, the title of table 6.16 in the NIR reads: “Coefficients used for the calculations of emissions from cultivation of N-fixing crops...” (line 1, page 109); whereas it should read: “Coefficients used for selected crop residue statistics...”. In order to improve transparency, the ERT recommends that Cyprus develop and implement tier 1 QC procedures in accordance with the IPCC good practice guidance in order to prevent such errors.

59. The ERT noted that the NIR provides limited and unclear information on category-specific planned improvements. In response to questions raised by the ERT on this topic, Cyprus provided an improvement plan for applying tier 2 methods for estimating emissions from enteric fermentation and manure management for cattle. The ERT welcomes this plan and encourages Cyprus to provide further details on the improvement plans for all key categories in the agriculture sector in its inventory submission.

2. Key categories

Enteric fermentation – CH₄

60. CH₄ emissions from enteric fermentation is identified as a key category, in which cattle and sheep are significant (accounting for 44.3 and 31.4 per cent of the emissions from enteric fermentation, respectively). Cyprus applied a tier 1 method for the estimation of emissions from all livestock species. The EFs used are the IPCC defaults for Western Europe for dairy cattle and non-dairy cattle. Developed countries’ default EFs were applied for all other livestock species. In response to questions raised by the ERT during the review, Cyprus informed it that the necessary data for using a tier 2 method for estimating

emissions from the enteric fermentation of dairy cattle have been collected and will be used for the next inventory submission. The ERT welcomes this planned improvement and recommends that Cyprus estimate emissions for all significant livestock categories using an enhanced livestock characterization and a tier 2 method in accordance with the IPCC good practice guidance.

61. Cyprus has not reported data on the milk productivity of dairy cattle in the period 1990–2011 in the CRF tables. The ERT considers that this is not in accordance with paragraph 48 of the UNFCCC reporting guidelines. In response to questions raised by the ERT during the review regarding data on the milk productivity of dairy cattle, Cyprus indicated that such data will be provided in the next inventory submission. The ERT recommends that Cyprus include the milk productivity data for dairy cattle as a basis for estimating the EFs, verify the data and report them.

Manure management – CH₄ and N₂O³

62. The ERT noted that Cyprus has applied IPCC default Nex rates inconsistently across the livestock species. The default value for Western Europe is applied for dairy cattle and the default value for Eastern Europe is applied for non-dairy cattle. In response to questions raised by the ERT during the review regarding the default Nex values chosen, Cyprus indicated that the default Nex value for Western Europe will be used for non-dairy cattle for the next inventory submission. The ERT recommends that Cyprus update the Nex values used, as planned, and provide the rationale for the use of all default Nex values.

63. The ERT also noted that Cyprus used country-specific data based on expert judgement for the allocation of manure to the different animal waste management systems (AWMS). However, no documentation and/or justification for these data could be found in the NIR. In response to questions raised by the ERT during the review regarding the documentation of and justification for the allocation of manure to the different AWMS, Cyprus provided a paper published in the SEEP2010 conference proceedings with an overview of the allocation of manure to the different AWMS in Cyprus. In order to improve transparency, the ERT recommends that Cyprus include this document as a reference in the NIR.

64. Cyprus used a tier 1 method for the estimation of CH₄ emissions from manure management. It used the default IPCC EFs for Eastern Europe for dairy cattle and non-dairy cattle, the default EFs for Western Europe for swine and the default EFs for developed countries for other animals. However, Cyprus does not provide its rationale for choosing such EFs. In response to the questions raised by the ERT during the review regarding the EFs chosen, Cyprus explained that they were chosen on the basis of the nature of AWMS in regions that have similar conditions to Cyprus. The ERT recommends that Cyprus include this information, with an additional description of the country's manure management systems for cattle and swine, in the NIR.

Agricultural soils – N₂O

65. Cyprus estimated N₂O emissions from direct soil emissions using the IPCC tier 1a methodology. The ERT found that N₂O emissions from cultivated organic soils have been reported as “NE” and the application of sewage sludge to agricultural soils has not been taken into account as an additional form of organic nitrogen applied to agricultural soils. In

³ CH₄ emissions from manure management is not a key category, but comments relating to CH₄ and N₂O emissions are presented together here because N₂O emissions from manure management is a key category and some comments concern issues relating to the estimation of emissions of both CH₄ and N₂O.

response to a question raised by the ERT during the review regarding the estimates of N₂O emissions from the application of sewage sludge to agricultural soils, Cyprus informed the ERT that such estimations will be carried out for the next inventory submission. The ERT recommends that Cyprus estimate and report N₂O emissions from cultivation of histosols. Furthermore, the ERT welcomes the planned improvement and encourages Cyprus to document all relevant information on the methods and data used for calculating N₂O emissions from the application of sewage sludge to agricultural soils in the NIR.

66. Cyprus estimated direct emissions of N₂O from agricultural soils using EFs for synthetic fertilizers (0.0112 kg N₂O-N/kg N) and animal manure applied to soils (0.00948 kg N₂O-N/kg N) and reported these values in CRF table 4.D. The ERT noted that these EF values are lower than the IPCC default value (0.0125 kg N₂O-N/kg N) provided in table 4.17 of the IPCC good practice guidance. In response to questions raised by the ERT during the review regarding the values of the EFs used for synthetic fertilizers and animal manure applied to soils, Cyprus informed the ERT that those EFs were used for the estimation in error and that Cyprus will revise the estimates using the IPCC default value (0.0125 kg N₂O-N/kg N). The ERT recommends that Cyprus correct this error. Furthermore, the ERT encourages Cyprus to implement QC activities in order to compare the EFs used with the IPCC default EFs during the inventory preparation process.

67. Cyprus reported an estimation of N₂O emissions from N-fixing crops in its NIR (table 6.15) and CRF table 4.D as well as on the agricultural worksheet (Excel) provided to the ERT during the review week (rows 469 to 474 of sheet 1 of the worksheet). The ERT considers that this estimation is not in line with chapter 4.7 of the IPCC good practice guidance because the Party used three parameters: the fraction burned in the fields, the carbon fraction and the nitrogen to carbon ratio (N/C ratio);. The fraction of nitrogen in N-fixing crops of dry matter is not used when calculating the amount of nitrogen fixed by N-fixing crops, which is not in line with equations 4.25 and 4.26 of the IPCC good practice guidance. In response to a question raised by the ERT during the review regarding the estimation of N₂O emissions from N-fixing crops, Cyprus informed the ERT that it intends to correct the mistake in the calculation of N₂O emissions from N-fixing crops for its next inventory submission. The ERT recommends that Cyprus use equation 4.25 of the IPCC good practice guidance for the calculation of N₂O emissions from N-fixing crops and document the revised estimates in the NIR.

3. Non-key categories

Field burning of agricultural residues – CH₄ and N₂O

68. Cyprus reported default parameters for the dry matter fraction of oats, dry beans and peas as 0.83, 1.00 and 1.00, respectively, and these were applied to the estimation of emissions from field burning of agricultural residues in table 6.16 of its NIR. The ERT considers that this is not in line with chapter 4.7.1 of the IPCC good practice guidance because the values do not correspond with the default values provided in table 4.16 of the IPCC good practice guidance (oats: 0.92; dry beans: 0.82–0.89; and peas: 0.87). In response to a question raised by the ERT during the review regarding the parameters used for the dry matter fraction of oats, dry beans and peas, Cyprus explained that the parameters are not correct and that it will revise them. The ERT recommends that Cyprus revise the parameter values by using the default values provided in table 4.16 of the IPCC good practice guidance, as well as document the revised estimates and their impact on time-series consistency in the NIR.

69. Cyprus has applied the value of 0.45 for the carbon fraction of residues for potatoes to estimate emissions (as stated in its NIR, table 6.16). This value is higher than the default value provided in table 4.16 of the IPCC good practice guidance (0.4226), the values

applied for the carbon fraction of residues for oats, dry beans and peas, and the values for the ratio for barley and oats, which are not included in the IPCC default values. Cyprus did not provide any rationale for using these values. In response to questions raised by the ERT during the review regarding the application of these values, Cyprus explained that the value for the carbon fraction of residues used for potatoes is not correct and that it will revise it. The ERT recommends that Cyprus revise this parameter value by using the default value provided in table 4.16 of the IPCC good practice guidance and provide the rationale for applying the N/C ratio for barley and oats as well as the carbon fraction of residues for oats, dry beans and peas in the NIR.

70. Cyprus estimated the CH₄ and N₂O emission trends for this category by assuming that 100 per cent of the residues were burned on site in 1990 and that the percentage has decreased gradually to 10 per cent up to 2008 and later years. However, the NIR does not provide any reference document or justification for assuming this. In response to questions raised by the ERT during the review regarding the provision of documentation that substantiates the assumption, Cyprus informed the ERT that such documentation is not available. The ERT recommends that Cyprus provide the relevant justification (e.g. an expert judgement) and supporting documentation for this parameter in the NIR.

E. Land use, land-use change and forestry

1. Sector overview

71. In 2011, net removals from the LULUCF sector amounted to 76.47 Gg CO₂ eq. Since 1990, net removals have decreased by 44.9 per cent. The sector was a net sink during the period 1990–2011, with the exception of in 1998 (emissions of 25.54 Gg CO₂ eq), when it was a source due to forest fires. The key driver for the removals is forest land remaining forest land and an increase in the area covered by forests by 211 ha. Within the sector, net removals of 77.94 Gg CO₂ eq were from forest land, while no net emissions were reported for cropland, grassland, settlements, wetlands or other land owing to lack of data. Other (LULUCF) was responsible for emissions of 1.47 Gg CO₂ eq.

72. The main data source for the land use for the whole of Cyprus (including the areas that are not under the effective control of the Government of Cyprus) is the CORINE Land Cover Map 2006. The ERT noted that Cyprus uses only the CORINE Land Cover Map 2006, although the CORINE Land Cover Map is available for earlier years and also for 2010. The ERT encourages Cyprus to use other maps in addition to the 2006 CORINE Land Cover Map to produce a consistent time series of land areas in accordance with the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). This means that CORINE Land Cover Maps for 1990, 2000, 2006 and 2010 could be used to develop a consistent time series of land areas for future inventory submissions.

73. The ERT also noted that Cyprus did not classify land use according to the IPCC good practice guidance for LULUCF and the CRF tables. The ERT recommends that Cyprus specify in the NIR and in the CRF tables which type of land conversions to forest land are included. Information on the methods, data and parameters used should be provided in the NIR. When subcategories are based on climatic zones, forest types and tree species, etc., Cyprus is also recommended to provide in the NIR descriptions of the subcategories used in preparing the estimates. The ERT further recommends that Cyprus classify the land areas in accordance with the six land-use categories from the IPCC good practice guidance for LULUCF.

74. The ERT further noted that Cyprus does not follow the IPCC method of reporting cumulative areas over a 20-year transition period (or over a longer transition period selected

by the Party) for the land-use change conversion categories. Therefore, the ERT recommends that Cyprus report the areas converted to a different land use under the relevant land-use conversion category for 20 consecutive years before reporting them under the corresponding land remaining category. This means that, for each year, the cumulative total area reported under each land-use change category should equal the cumulative area that has been converted to that land use over the last 20 years; however, the area of land under conversion that has been subject to a second land-use change during the 20-year conversion period should be subtracted from the cumulative total.

75. Furthermore, the ERT noted that Cyprus did not provide information on unmanaged land. For each year, the area reported under the land remaining under the same land-use category should equal the area reported for that category for the previous year minus the area lost during the year because of conversion to other land uses, plus the area that was converted to this category 20 years before or in a previous year in accordance with the conversion period selected by the Party. The ERT recommends that, in order to increase transparency, Cyprus provide information on managed and unmanaged land in its NIR and follow the IPCC good practice guidance for LULUCF by specifying each land category as, for example, forest land remaining forest land and land converted to forest land.

76. The ERT noted that information on the documentation of approaches used for representing land areas and land-use databases used for the inventory preparation has been listed by Cyprus as “NA” (chapter 7.2.2 of the NIR). The ERT recommends that Cyprus increase the transparency of its reporting by providing information on the approaches used for the consistent representation of land areas, including definitions and the classification system, in accordance with the IPCC good practice guidance for LULUCF. Cyprus should take national definitions into account first and use international databases and other sources, such as the *Global Forest Resources Assessment 2000* of the Food and Agriculture Organization of the United Nations (FAO), the *Global Forest Resources Assessment 2010*, the United Nations Economic Commission for Europe’s *Temperate and Boreal Forest Resources Assessment 2000*, and the *State of Europe’s Forests 2003* by the 4th Ministerial Conference on the Protection of Forests in Europe (annex 2A.2 of the IPCC good practice guidance for LULUCF and the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*), as guidance.

77. Cyprus calculated the time series of land use and land-use change using data for forest land areas for 1990, 2000, 2005 and 2007 and projections for 2010 obtained from the Department of Forestry. Data to complete the time series for the areas subject to land use for the remaining years were derived on the assumption that the changes were linear. It is not clear in the NIR whether the inter-annual variations in the areas are due to the methodology used. During the review, the ERT raised a question on the time-series consistency of the areas subject to land use and land-use change reported in the NIR for the land-use areas which show large inter-annual variations. The Party did not provide a response. The ERT recommends that Cyprus apply interpolation techniques in accordance with the IPCC good practice guidance for LULUCF to ensure that the inter-annual variation in the time series for the areas subject to land-use change reflect real changes and are not due to changes in the underlying data and assumptions.

78. The ERT identified that Cyprus reports 0 Mg C/ha for carbon stock changes in mandatory carbon pools (living biomass, dead organic matter and mineral and organic soils) for land-use conversions to forest land, cropland, grassland, wetlands, settlements and other land. The Party acknowledged that the reporting of zero is not consistent with the IPCC good practice guidance for LULUCF and stated that it will provide correct units in the next inventory submission. The ERT recommends that Cyprus explore the use of, where relevant, the carbon stock change factors and assumptions used for the estimation of the carbon stock

changes in living biomass, dead wood and litter, and ensure comparability between the land-use changes both to and from a category.

79. The ERT noted that Cyprus did not use the appropriate notation keys in the CRF tables, nor did it provide a relevant explanation in the NIR. The ERT recommends that, in order to ensure transparent reporting, Cyprus use “NO” for any category, pool and/or gas for which the Party has information confirming that it does not occur, and to provide such information in the NIR, and use “NE” for categories, pools and/or gases for which there is no information on emissions/removals or for which net emissions/removals are negligible. Furthermore, the ERT recommends that Cyprus does not leave any cells blank in the CRF tables (e.g. for land converted to forest land in CRF table 5.A), thereby ensuring that either an estimate or a notation key is reported in all cells. In response to questions raised by the ERT during the review, Cyprus explained that there are no data to enable reporting on the mandatory carbon pools. The ERT recommends that Cyprus report on all of the mandatory carbon pools in accordance with the default method in the IPCC good practice guidance for LULUCF.

80. Similarly, the ERT noted that carbon stock change for land converted to cropland is reported as 0 Mg C/ha. The carbon stock changes in soil organic matter (SOM) associated with land-use changes have not been reported in CRF table 5.B. The ERT recommends that Cyprus estimate the changes in SOM associated with land-use changes, applying the IPCC default methodology and reporting the notation key “NE” instead of zero in the CRF tables. Where a lack of country-specific data on the soil carbon content for the different land-use categories hinders the estimation of changes in SOM, the ERT recommends that Cyprus use default data from the IPCC good practice guidance for LULUCF. Furthermore, the ERT encourages the Party to use data on European soils stored in the European Union Joint Research Centre data repository.

81. The ERT also noted that Cyprus reported emissions from wildfires under forest land remaining forest land and land converted to forest land in the CRF tables. The ERT welcomes this disaggregation of forest land and land converted to forest land and encourages Cyprus to continue to subdivide the forest area burned on the basis of the proportional contribution of each category to the total forest land area. However, emissions from forest fires for land converted to forest land are not reported for 2011. The ERT recommends that Cyprus provide the missing estimates for 2011.

82. The ERT further noted that the NIR and the CRF tables contain gaps in reporting, for example the inadequate coverage of land areas, missing carbon pools and missing data reported as zero values. The ERT noted that failure to present relevant carbon pools leads to the incomplete reporting of emissions and removals. During the review, Cyprus indicated to the ERT that it has begun developing infrastructure and system arrangements to obtain the necessary land use and land-use change data, though there is no formal agreement as yet. In addition, a team made up of representatives from the departments responsible for land use and management has been set up and meetings are taking place to collect an initial set of all information related to land use since 1990 and to come to an agreement on the assumptions that can be used where data are not available. This work is expected to be completed in January 2015. The ERT recommends that Cyprus include information on the missing carbon pools and data.

2. Key categories

Forest land remaining forest land – CO₂

83. The ERT noted that Cyprus did not provide a full description of the method used to estimate carbon stock changes in living biomass for forest land remaining forest land. In response to questions raised by the ERT during the review, Cyprus highlighted that, owing

to a lack of data, it was unable to distinguish between total growth increment and carbon losses for living biomass carbon stock changes. The ERT recommends that, to ensure transparent reporting, Cyprus provide detailed information on the approach and method used to estimate carbon stock changes in living biomass.

84. The time-series data on forest areas show that the inter-annual changes in the net carbon stock changes in living biomass for forest land remaining forest land are unstable and the trend fluctuates. The ERT noted that the reported inter-annual changes may not represent the actual trends in the annual stock changes. The ERT recommends that Cyprus use interpolation and extrapolation techniques in calculating annual estimates for carbon stock changes and make efforts to reduce the influence of random variation in the annual estimates for living biomass for its future inventory submissions. Furthermore, in order to increase transparency and ensure completeness of reporting for all carbon pools, the ERT recommends that Cyprus provide in its NIR annual estimates of the carbon gains and losses in forest land calculated using the IPCC default method (equation 3.2.2 and associated equations in the IPCC good practice guidance for LULUCF).

F. Waste

1. Sector overview

85. In 2011, emissions from the waste sector amounted to 590.44 Gg CO₂ eq, or 6.4 per cent of total GHG emissions. Since 1990, emissions have increased by 25.6 per cent. The key drivers for the rise in emissions are the increases in population and solid waste production per capita, which are due to changes in social conditions. Within the sector, 91.7 per cent of the emissions were from solid waste disposal on land, followed by 8.3 per cent from wastewater handling. Waste incineration started in Cyprus in 2003, but there are no data available to estimate the emissions resulting from the operation of incinerators.

2. Key categories

Solid waste disposal on land – CH₄

86. The ERT noted that the methodology used by Cyprus to estimate CH₄ emissions was the tier 1 method from the Revised 1996 IPCC Guidelines, which is in line with the IPCC good practice guidance. However, the description of the method in the NIR is not sufficiently transparent. The ERT recommends that Cyprus report all details of the assumptions used in the methodology, in order to enhance the transparency of its reporting.

87. The NIR stated that there was a sudden decrease in emissions between 2010 and 2011; however, the NIR did not provide a rationale for this decrease. In response to a question raised by the ERT during the review, Cyprus responded that it was as a result of the increase in the amount of packaging waste recycled and that this will be included in the NIR of its next inventory submission. The ERT recommends that Cyprus include this information in the NIR.

88. It was observed in the NIR that for 1990–2006 information was provided for the estimation of the proportions of solid waste disposed on land going to managed sites. The ERT noted that no information was provided for the years 2007–2011. In response to a question raised by the ERT during the review, Cyprus responded that this was a mistake and that the information will be provided in the next inventory submission. The ERT recommends that Cyprus provide the information in the NIR, in order to enhance the transparency and consistency of the reporting.

89. The ERT noticed during the review that the total percentage of the fractions comprising the waste composition does not amount to 100 per cent. Table 8.5 of the NIR

indicated that the fractions comprising the total waste composition totalled 76.8 and 73.8 per cent for the years 1990–2000 and 2001–2011, respectively. In response to a question raised by the ERT during the review on this issue, Cyprus explained that this is a mistake and will be corrected in the next inventory submission. The ERT recommends that Cyprus correct this mistake.

90. The ERT noted that Cyprus indicates in the NIR that all unmanaged disposal sites are considered shallow without taking depth into consideration. In response to questions raised by the ERT during the review, Cyprus explained that at the time that the first emission report was prepared in Cyprus to fulfil European Union obligations in 2006, this was the assumption used. However, the current assumption will be revised for the next inventory submission since new data with details on waste disposal sites in the country are available. The ERT recommends that Cyprus revise this assumption and include it in the NIR, in order to enhance the transparency of its reporting.

91. The ERT also noted that the fraction of municipal solid waste (MSW) disposed to solid waste disposal sites (SWDS) is reported as 0.00 under additional information in CRF table 6.A for 1990–1996, while CH₄ emissions for this category have been reported. The ERT recommends that Cyprus report correct values for the fraction of MSW disposed to SWDS in the CRF tables.

92. The additional information provided in CRF table 6.A is incomplete for 2011. No data were provided on the urban population and per capita waste generation. In response to the questions raised by the ERT on this issue during the review, Cyprus explained that it failed to enter the necessary information in the table. The ERT recommends that Cyprus fill in the necessary additional information in CRF table 6.A.

3. Non-key categories

Wastewater handling – CH₄ and N₂O

93. The ERT noted that Cyprus did not provide detailed information on the type of handling system used for the treatment of wastewater and sludge or the methodology used to estimate emissions. The ERT recommends that Cyprus provide in the NIR detailed information on the type of handling system used for the treatment of wastewater and sludge as well as the methodology used for the estimation of emissions, in order to enhance the transparency of its reporting.

94. During the review, the ERT also noted that data related to method were not provided for industrial wastewater for 2011 in chapter 8.1.2 of the NIR. In response to questions raised by the ERT during the review on this issue, Cyprus responded that data were not available and therefore production in 2011 was considered to be the same as in 2010. This is contradictory to item (a) in chapter 8.3.2 of the NIR. The ERT recommends that Cyprus correct this in the NIR.

95. The ERT further noted that the figures provided for N₂O emissions from wastewater handling are constant for 1990 to 2007 without explanation in the NIR. In response to questions raised by the ERT during the review, Cyprus responded that the emissions fluctuate over the years, but at values that are too small to be indicated using Gg N₂O. The ERT recommends that Cyprus provide this explanation in the NIR, in order to enhance the transparency of its reporting.

III. Conclusions and recommendations

A. Conclusions

96. Table 6 summarizes the ERT’s conclusions on the 2013 inventory submission of Cyprus, in accordance with the UNFCCC review guidelines.

Table 6
Expert review team’s conclusions on the 2013 inventory submission of Cyprus

			<i>Cross references</i>
The ERT concludes that the inventory submission of Cyprus is complete (categories, gases, years and geographical boundaries) and contains both an NIR and CRF tables for 1990–2011			
Non land use, land-use change and forestry ^a	Not complete	Table 3	
Land use, land-use change and forestry ^a	Not complete	Table 3	
The ERT concludes that the inventory submission of Cyprus has been prepared and reported in accordance with the UNFCCC reporting guidelines	Yes	61 and table 4	
The Party’s inventory is in accordance with the <i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i> , the <i>IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i> and the <i>IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>	Yes	33, 56, 60, 67, 68, 73, 74, 75, 76, 77 and table 4	
The institutional arrangements continue to perform their required functions	Yes		

Abbreviations: CRF = common reporting format, ERT = expert review team, IPCC = Intergovernmental Panel on Climate Change, 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”.

^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 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*).

B. Recommendations

97. The ERT identified the issues for improvement listed in table 7. All recommendations are for the next inventory submission, unless otherwise specified.

Table 7
Recommendations identified by the expert review

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
Cross-cutting		Improve the transparency of the reporting on all sectors	Table 3
		Give priority to the collection of the necessary AD for the energy and industrial processes sectors in order to complete	9

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		the inventory	
		Include the relevant ministries and agencies in the institutional arrangements for inventory preparation in order to make reporting on LULUCF possible	10
		Include the revised uncertainty analysis in chapter 1.7 of the NIR (not only in the annex)	Table 4
		Include an uncertainty analysis for LULUCF, after completing the LULUCF reporting	Table 4
		Report notation keys in the CRF tables instead of leaving empty cells and/or reporting zeros	Table 4
		Provide relevant information in the explanation columns of the CRF tables	Table 4
		Improve the transparency of the reporting on how emissions are estimated by including information on efforts to reconcile energy balance and EU ETS data, as well as additional information on the use of EU ETS data and an explanation of how the time-series consistency of the emission estimates is ensured	18
Energy	Reference and sectoral approaches	Report apparent energy consumption in CRF table 1.A(c)	24
		Provide an explanation for the difference in the import values for petroleum products between the International Energy Agency data and the values reported in CRF table 1.A(b) for all years in the NIR	25
	International bunker fuels	Collect separate AD for international navigation and report the related emissions under civil aviation	26
		Collect separate AD for international navigation and report the related emissions under marine bunkers	27
	Feedstocks and non-energy use of fuels	Change the reported notation key to “NO”, if emissions are determined to be not occurring	28
	Stationary combustion: liquid fuels – CO ₂	Use country- and/or plant-specific EFs when available, and carry out QA procedures on the reported data	30
		Conduct research to determine whether the fuel allocation reported for 2005 onward is reflective of the situation in previous years of the time series	31
		Investigate and explain the reasons behind the fluctuation in IEFs	32
		Report disaggregated AD for manufacturing industries and construction in line with the IPCC good practice guidance in the NIR	33

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		Investigate the nature and use of liquid fuels (other) and report thereon in the NIR	34
		Correct the inconsistency of methodological information between the NIR and the CRF tables	35
	Stationary combustion: solid fuels – CO ₂	Make efforts to generate country-specific CO ₂ EFs and use higher-tier methods for the entire reporting period	36
	Road transportation: liquid fuels – CO ₂	Provide the reason why the EFs applied deviate from the IPCC default EFs in the NIR	38
	Stationary combustion: biomass – CH ₄ and N ₂ O	Correct the inconsistency between the information on solid biomass consumption for the residential sector for 2001 reported in table 3.22 of the NIR (2,300.00 TJ) and that in the CRF tables (229.99 TJ) and ensure consistency of reporting, especially between the NIR and the CRF tables, through tier 1 QC activities	39
		Investigate the definition and boundaries of the AD and implement a QA/QC procedure to ensure time-series consistency	40
	Road transportation: biomass – CH ₄ and N ₂ O	Correct inconsistencies and ensure consistency of reporting, especially between the NIR and the CRF tables, through tier 1 QC activities	41
Industrial processes and solvent and other product use	Sector overview	Conduct the improvement plan for reporting more categories and report emissions for those categories	43
		Investigate the final use of HFC-134a bulk imports and revise the estimates of actual emissions, if necessary	51
	Consumption of halocarbons and SF ₆ – HFCs	Keep up the efforts to ensure time-series consistency in the estimates of HFC emissions from refrigeration and air-conditioning equipment by estimating emissions for historical years	45
		Further examine whether emissions from manufacturing occur in the country and, as appropriate, report values or revise the use of the notation keys reported	46
		Further investigate whether there is additional information on disposal of equipment and either report the associated emissions or change the notation key reported to “NE”	47
		Compare the reliability of the estimates derived from the model and the estimates derived from national statistics, and estimate and report emissions for this category using a more reliable method and better data	48
		Collect documentation that supports the assumptions used or use the default charges from the IPCC good practice guidance	49

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		Continue efforts to collect information on fire-extinguishing equipment and report the relevant emission estimates	50
	Limestone and dolomite use – CO ₂	Improve the completeness of the reporting by including estimates of emissions from dolomite use	53
Agriculture	Sector overview	Improve the reporting in the NIR by including the information provided to the ERT during the review on the methods, EFs and AD used across the sector	56
		Provide a description of and justification for the fraction of agricultural residues actually burned in fields	56
		Apply higher-tier methods and collect country-specific data for all key categories in accordance with the decision tree in the IPCC good practice guidance	56
		Improve the consistency of the information between the CRF tables and the NIR	57
		Develop and implement tier 1 QC procedures in accordance with the IPCC good practice guidance to prevent wrong descriptions in the NIR	58
	Enteric fermentation – CH ₄	Estimate emissions for all significant livestock categories using an enhanced livestock characterization and a tier 2 method in accordance with the IPCC good practice guidance	60
		Include the milk productivity data for dairy cattle as a basis for estimating the EFs, verify these data and report them	61
	Manure management – CH ₄ and N ₂ O	Update the Nex values, as planned, and provide the rationale for the use of all default Nex values	62
		Include the document on allocation of manure to the different AWMS in Cyprus as a reference in the NIR	63
		Include information on the choice of default EFs, with an additional description of the country's manure management systems for cattle and swine, in the NIR	64
	Agricultural soils – N ₂ O	Estimate and report N ₂ O emissions from cultivation of histosols	65
		Correct the errors in the EFs used for synthetic fertilizers (0.0112 kg N ₂ O-N/kg N) and animal manure applied to soils (0.00948 kg N ₂ O-N/kg N)	66
		Use equation 4.25 from the IPCC good practice guidance for the calculation of N ₂ O emissions from N-fixing crops and document the revised estimates	67
	Field burning of agricultural residues – CH ₄ and N ₂ O	Revise the parameter values for the dry matter fraction of oats, dry beans and peas as provided in table 4.16 of the IPCC good practice guidance and document the revised estimates and their impact on time-series consistency	68
		Revise the values of the default parameters for the dry matter	69

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		fraction of oats, dry beans and peas as provided in table 4.16 of the IPCC good practice guidance and document the revised estimates and their impact on time-series consistency	
		Provide the relevant justification for (e.g. an expert judgement) and supporting documentation on the assumption that 100 per cent of residues were burned on site in 1990 and that this decreased gradually to 10 per cent until 2008 and later years	70
LULUCF	Sector overview	Specify in the NIR and the CRF tables which type of land conversions to forest land are included	73
		Classify the land areas in accordance with the six land-use categories in the IPCC good practice guidance for LULUCF	73
		Report the areas converted to a different land use under the relevant land-use conversion category for 20 consecutive years before reporting them under the corresponding land remaining category	74
		Provide information on managed and unmanaged land in the NIR and follow the IPCC good practice guidance for LULUCF by specifying each land category as, for example, forest land remaining forest land and land converted to forest land	75
		Increase the transparency of the reporting by providing information on the approaches used for the consistent representation of land areas, including definitions and the classification system, in accordance with the IPCC good practice guidance for LULUCF	76
		Apply interpolation techniques in accordance with the IPCC good practice guidance for LULUCF to ensure that the inter-annual variation in the time series for the areas subject to land-use change reflect real changes and are not due to changes in the underlying data and assumptions	77
		Explore the use of, where relevant, the carbon stock change factors and assumptions used for the estimation of the carbon stock changes in biomass, dead wood and litter, and ensure comparability between the land-use changes both to and from a category	78
		Report “NO” for any category, pool and/or gas for which there is information confirming that it does not occur, and provide such information in the NIR, and report “NE” for categories, pools and/or gases for which there is no information on emissions/removals or for which net emissions/removals are negligible	79
		Do not leave any cells blank in the CRF tables (e.g. for land converted to forest land in CRF table 5.A), thereby ensuring that either an estimate or a notation key is reported in all cells	79

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		Report all of the mandatory carbon pools in accordance with the default method in the IPCC good practice guidance for LULUCF	79
		Estimate the changes in soil organic matter associated with land-use changes, applying the IPCC default methodology and reporting the notation key “NE” instead of a zero value in the CRF tables	80
		Use default data from the IPCC good practice guidance for LULUCF	80
		Provide the missing estimates of emissions from forest fires for land converted to forest land for 2011	81
		Include information on the missing carbon pools and data	82
	Forest land remaining forest land – CO ₂	Provide detailed information on the approach and method used to estimate carbon stock changes in living biomass	83
		Use interpolation and extrapolation techniques in calculating annual estimates for carbon stock changes and make efforts to reduce the influence of random variation in the annual estimates for living biomass	84
		Provide in the NIR annual estimates of the carbon gains and losses in forest land calculated using the IPCC default method (equation 3.2.2 and associated equations in the IPCC good practice guidance for LULUCF)	84
Waste	Solid waste disposal on land – CH ₄	Report all details of the assumptions used in the methodology	86
		Include the information on a sudden decrease in emissions between 2010 and 2011 in the NIR	87
		Provide information on the proportions of solid waste disposed on land going to managed sites for 2007–2011 in the NIR	88
		Correct each percentage of waste composition	89
		Revise the assumption that all unmanaged disposal sites are considered shallow and include it in the NIR, in order to enhance the transparency of the reporting	90
		Report correct values for the fraction of municipal solid waste disposed to solid waste disposal sites in the CRF tables	91
		Fill in the additional information in CRF table 6.A	92
	Wastewater handling – CH ₄ and N ₂ O	Provide detailed information on the type of handling system used for the treatment of wastewater and sludge as well as the methodology used for the estimation of emissions	93
		Correct the wrong description in chapter 8.3.2 of the NIR	94

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Cross reference</i>
		Provide an explanation for the fluctuation in N ₂ O emissions in the NIR	95

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, EU ETS = European Union Emissions Trading System, IPCC = Intergovernmental Panel on Climate Change, LULUCF = land use, land-use change and forestry, NE = not estimated, Nex = nitrogen excretion, NIR = national inventory report, NO = not occurring QA/QC = quality assurance/quality control.

Annex I

Documents and information used during the review

A. Reference documents

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

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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>.

Status report for Cyprus 2013. Available at <http://unfccc.int/resource/docs/2013/asr/cyp.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2013. Available at <http://unfccc.int/resource/webdocs/sai/2013.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Nicoletta Kythreotou (Environment Officer at the Department of Environment), including additional material on the methodologies and assumptions used.

Annex II

Acronyms and abbreviations

AD	activity data
AWMS	animal waste management system
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CRF	common reporting format
EF	emission factor
ERT	expert review team
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ without GHG emissions and removals from LULUCF
HFCs	hydrofluorocarbons
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram (1 kg = 1,000 grams)
LULUCF	land use, land-use change and forestry
Mg	megagram (1 Mg = 1 tonne)
MSW	municipal solid waste
NA	not applicable
NE	not estimated
NO	not occurring
Nex	nitrogen excretion
N ₂ O	nitrous oxide
NIR	national inventory report
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10 ¹⁵ joule)
QA/QC	quality assurance/quality control
SF ₆	sulphur hexafluoride
SOM	soil organic matter
SWDS	solid waste disposal site
TJ	terajoule (1 TJ = 10 ¹² joules)
UNFCCC	United Nations Framework Convention on Climate Change
