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Report on the individual review of the annual submission of Greece submitted in 2022*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual inventory of emissions and removals of greenhouse gases for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual review of the 2022 annual submission of Greece, conducted by an expert review team in accordance with the “Guidelines for review under Article 8 of the Kyoto Protocol”. The review took place from 5 to 10 September 2022 in Bonn.

* In the symbol for this document, 2022 refers to the year in which the inventory was submitted, not to the year of publication.



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Abbreviations and acronyms

| | |
|--------------------------------|---|
| 2006 IPCC Guidelines | <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> |
| AAU | assigned amount unit |
| AD | activity data |
| Annex A source | source category included in Annex A to the Kyoto Protocol |
| AR | afforestation and reforestation |
| Article 8 review guidelines | “Guidelines for review under Article 8 of the Kyoto Protocol” |
| BCEF | biomass conversion and expansion factor |
| C ₂ F ₆ | hexafluoroethane |
| C _a | coefficient corresponding to net energy required for dairy cattle to acquire feed |
| CER | certified emission reduction |
| CF ₄ | carbon tetrafluoride |
| CH ₄ | methane |
| CM | cropland management |
| CORINE | Coordination of Information on the Environment |
| CO ₂ | carbon dioxide |
| CO ₂ eq | carbon dioxide equivalent |
| Convention reporting adherence | adherence to the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories” |
| CPR | commitment period reserve |
| CRF | common reporting format |
| CSC | carbon stock change |
| EEC | European Economic Commission |
| EF | emission factor |
| ERT | expert review team |
| ERU | emission reduction unit |
| EU | European Union |
| EU ETS | European Union Emissions Trading System |
| FAO | Food and Agriculture Organization of the United Nations |
| FAOSTAT | statistical database of the Food and Agriculture Organization of the United Nations |
| F-gas | fluorinated gas |
| FM | forest management |
| FMP | forest management plan |
| FMRL | forest management reference level |
| GHG | greenhouse gas |
| GM | grazing land management |
| HFC | hydrofluorocarbon |
| HWP | harvested wood products |
| IE | included elsewhere |
| IEF | implied emission factor |
| IPCC | Intergovernmental Panel on Climate Change |
| IPPU | industrial processes and product use |
| KP reporting adherence | adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol |
| KP-LULUCF | activities under Article 3, paragraphs 3–4, of the Kyoto Protocol |
| LULUCF | land use, land-use change and forestry |

| | |
|---|---|
| N | nitrogen |
| N ₂ O | nitrous oxide |
| NA | not applicable |
| NE | not estimated |
| NF ₃ | nitrogen trifluoride |
| NIR | national inventory report |
| NO | not occurring |
| PFC | perfluorocarbon |
| QA/QC | quality assurance/quality control |
| RMU | removal unit |
| RV | revegetation |
| SEF | standard electronic format |
| SF ₆ | sulfur hexafluoride |
| SIAR | standard independent assessment report |
| SOC | soil organic carbon |
| SOC _{REF} | reference soil organic carbon stocks |
| SWDS | solid waste disposal site(s) |
| UNFCCC Annex I inventory 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 greenhouse gas inventories” |
| UNFCCC review guidelines | “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” |
| WDR | wetland drainage and rewetting |
| Wetlands Supplement | <i>2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands</i> |

I. Introduction

1. This report covers the review of the 2022 annual submission of Greece, organized by the secretariat in accordance with the Article 8 review guidelines (adopted by decision 22/CMP.1 and revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the “UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention” (annex to decision 13/CP.20). The review took place from 5 to 10 September 2022 in Bonn and was coordinated by Federico Brocchieri, Claudia do Valle, Javier Hanna and Davor Vesligaj (secretariat). Table 1 provides information on the composition of the ERT that conducted the review for Greece.

Table 1

Composition of the expert review team that conducted the review for Greece

| <i>Area of expertise</i> | <i>Name</i> | <i>Party</i> |
|--------------------------|-----------------------|--------------|
| Generalist | Valentina Idrissova | Canada |
| | Eva Krtkova | Czechia |
| Energy | Renata Soares Grisoli | Brazil |
| | Yves Marenne | Belgium |
| | Dingane Sithole | Zimbabwe |
| | Anand Sookun | Mauritius |
| IPPU | Joseph Baffoe | Ghana |
| | Siriluk Chiarakorn | Thailand |
| | Pia-Kristiina Forsell | Finland |
| | Maria Purzner | Austria |
| Agriculture | Jorge Lam Alvarez | Peru |
| | Yauheniya Bertosh | Belarus |
| | Anaïs Durand | France |
| | Steen Gyldenkærne | Denmark |
| LULUCF and KP-LULUCF | Tatenda Gotore | Zimbabwe |
| | Inge Jonckheere | Belgium |
| | Sekai Ngarize | Zimbabwe |
| Waste | Mayra Rocha | Brazil |
| | Sergii Shmarin | Ukraine |
| Lead reviewers | Valentina Idrissova | |
| | Mayra Rocha | |

2. The basis of the findings in this report is the assessment by the ERT of the Party’s 2022 annual submission in accordance with the UNFCCC review guidelines and the Article 8 review guidelines.

3. The ERT has made recommendations that Greece resolve identified findings, including issues¹ designated as problems.² Other findings, and, if applicable, the encouragements of the ERT to Greece to resolve related issues, are also included in this report.

¹ Issues are defined in decision 13/CP.20, annex, para. 81.

² Problems are defined in decision 22/CMP.1, annex, paras. 68–69, as revised by decision 4/CMP.11.

4. A draft version of this report was communicated to the Government of Greece, which provided no comments.
5. Annex I presents the annual GHG emissions of Greece, including totals excluding and including LULUCF, indirect CO₂ emissions, and emissions by gas and by sector, and contains background data on emissions and removals from KP-LULUCF, if elected by the Party, by gas, sector and activity.
6. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the Party’s 2022 annual submission

7. Table 2 provides the assessment by the ERT of the Party’s 2022 annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2

Summary of review results and general assessment of the 2022 annual submission of Greece

| <i>Assessment</i> | <i>Issue/problem ID#(s) in table 3 or 5^a</i> | |
|--|---|---|
| Dates of submission | Original submission: NIR, 15 April 2022; CRF tables (version 1), 15 April 2022; SEF tables, 15 April 2022. Revised submissions: CRF tables (version 4), 13 May 2022; (version 7), 9 September 2022. SEF tables, 25 August 2022. Unless otherwise specified, values from the most recent submission are included in this report. | |
| Review format | Centralized | |
| Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and the Wetlands Supplement (if applicable) | Have any issues been identified in the following areas: | |
| | (a) Identification of key categories? | No |
| | (b) Selection and use of methodologies and assumptions? | Yes I.8, L.16 |
| | (c) Development and selection of EFs? | Yes E.6, E.9, L.7, L.8, KL.8 |
| | (d) Collection and selection of AD? | Yes A.13, A.14, A.15, L.5, L.15, KL.9 |
| | (e) Reporting of recalculations? | No |
| | (f) Reporting of a consistent time series? | Yes L.16 |
| | (g) Reporting of uncertainties, including methodologies? | No |
| | (h) QA/QC? | QA/QC procedures were assessed in the context of the national system (see supplementary information under the Kyoto Protocol below) |
| | (i) Missing categories, or completeness? ^b | Yes I.10, L.10 |
| | (j) Application of corrections to the inventory? | No |
| Significance threshold | For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines? | Yes |
| Description of trends | Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable? | Yes |
| Supplementary information under | Have any issues been identified related to the following aspects of the national system: | |

| Assessment | Issue/problem ID#(s) in table 3 or 5 ^a |
|---|--|
| the Kyoto Protocol | (a) Overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements? No |
| | (b) Performance of the national system functions? No |
| | Have any issues been identified related to the national registry: |
| | (a) Overall functioning of the national registry? No |
| | (b) Performance of the functions of the national registry and the adherence to technical standards for data exchange? No |
| | Have any issues been identified related to the reporting of information on AAUs, CERs, ERUs and RMUs and on discrepancies in accordance with decision 15/CMP.1, annex, chapter I.E, in conjunction with decision 3/CMP.11, taking into consideration any findings or recommendations contained in the SIAR? No |
| | Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of the reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, in conjunction with decision 3/CMP.11, including any changes since the previous annual submission? No |
| | Have any issues been identified related to the following reporting requirements for KP-LULUCF: |
| | (a) Reporting requirements of decision 2/CMP.8, annex II, paragraphs 1–5? No |
| | (b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14? No |
| | (c) Reporting requirements of decision 6/CMP.9? No |
| | (d) Country-specific information to support provisions for natural disturbances in accordance with decision 2/CMP.7, annex, paragraphs 33–34? No |
| CPR | Was the CPR reported in accordance with decision 18/CP.7, annex; decision 11/CMP.1, annex; and decision 1/CMP.8, paragraph 18? Yes |
| Adjustments | Has the ERT applied any adjustments under Article 5, paragraph 2, of the Kyoto Protocol? No |
| | Has the Party submitted a revised estimate to replace a previously applied adjustment? NA |
| | Greece does not have a previously applied adjustment |
| Response from the Party during the review | Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for assessing conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties? Yes |
| Recommendation for an exceptional in-country review | On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review? No |

| <i>Assessment</i> | | <i>Issue/problem ID#(s) in table 3 or 5^a</i> |
|-----------------------------|---|---|
| Questions of implementation | Did the ERT list any questions of implementation? | No |

^a Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

^b Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of recommendations included in the previous review report

8. Table 3 compiles the recommendations from previous review reports that were included in the most recent previous review report, published on 25 April 2022,³ and had not been resolved by the time of publication of the report on the review of the Party’s 2021 annual submission. The ERT has specified whether it believes the Party had resolved, was addressing or had not resolved each issue or problem by the time of publication of this review report and has provided the rationale for its determination, which takes into consideration the publication date of the most recent previous review report and national circumstances.

Table 3
Status of implementation of recommendations included in the previous review report for Greece

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|--|--|
| General | | | |
| G.1 | CRF tables (G.1, 2021) (G.3, 2019) (G.5, 2017) Comparability | Report complete information in CRF table 9. | Not resolved. The Party did not update CRF table 9, explaining that it was not possible to do so owing to issues with CRF Reporter. During the review, Greece informed the ERT that information on the use of notation keys is provided in the relevant sectoral chapters of the NIR. The ERT considers that the recommendation has not yet been addressed because the Party has not yet reported complete information in CRF table 9. |
| G.2 | NIR (G.2, 2021) (G.5, 2019) Transparency | Improve transparency of reporting by implementing the category-specific recommendations identified in the respective sectoral sections of the previous review report (see document FCCC/ARR/2019/GRC, ID#s E.15, E.16, E.17, A.19, A.20, A.21, A.22, A.24, L.10, L.18, W.28, W.30, W.32, W.33, W.35 and W.37). | Resolved. The Party provided most of the requested additional information relating to the category-specific recommendations to improve the transparency of the reported emission estimates. The pending issues are addressed in the sector-specific sections (see ID#s E.3 and E.4 below). |
| Energy | | | |
| E.1 | 1.A.1.b Petroleum refining – liquid fuels – CO ₂ and CH ₄ (E.3, 2021) (E.13, 2019) Comparability | Reallocate the CO ₂ and CH ₄ emissions from flaring under subcategory 1.A.1.b (petroleum refining) to subcategory 1.B.2.c (venting and flaring) while ensuring time-series consistency, given that EU ETS data are not available for before 2005. | Not resolved. The Party continued to report CO ₂ and CH ₄ emissions from flaring under subcategory 1.A.1.b (petroleum refining) instead of under subcategory 1.B.2.c (venting and flaring). During the review, the Party explained that it is planning to address the recommendation for the next annual submission. |

³ FCCC/ARR/2021/GRC.

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|--|---|
| E.2 | 1.A.3.c Railways – CH ₄ and N ₂ O (E.14, 2021) Accuracy | Recalculate CH ₄ and N ₂ O emissions for subcategory 1.A.3.c railways for 1999 onward using correct EFs. | Resolved. The Party recalculated CH ₄ and N ₂ O emissions for subcategory 1.A.3.c (railways) for 1999 onward using correct EFs (4.15 kg CH ₄ /TJ and 28.6 kg N ₂ O/TJ) from the 2006 IPCC Guidelines (vol. 2, chap. 3, p.3.43). In the NIR (table 3.28, p.171), the Party reported the IEFs by fuel and year. Information on the recalculations was also provided in the NIR (p.174). |
| E.3 | 1.A.4 Other sectors – all fuels – CH ₄ and N ₂ O (E.8, 2021) (E.17, 2019) Transparency | Include in the NIR information on fuel consumption and EFs, disaggregated by fuel and sector, used for estimating CH ₄ and N ₂ O emissions for this category, and provide an explanation for the trend in emissions. | Addressing. The Party provided in its NIR (pp.121, 124 and 138) general information on the data source used for the EFs and on the emission trend for the category. However, the Party did not provide information on fuel consumption and the values of the CH ₄ and N ₂ O EFs disaggregated by fuel and sector to allow a complete assessment of the estimated emissions. During the review, the Party provided the AD disaggregated by fuel and sector and the EF values, which are based on the reference tables in the 2006 IPCC Guidelines (vol. 2, chap. 2, tables 2.4 (commercial/institutional) and 2.5 (residential and agriculture/forestry/fishing/fishing farms)). The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet reported in the NIR information on fuel consumption and the EFs used for estimating CH ₄ and N ₂ O emissions for this category, disaggregated by fuel and sector (see ID# E.9 in table 5). |
| E.4 | 1.A.4.c.ii Off-road vehicles and other machinery – diesel oil – CH ₄ and N ₂ O (E.15, 2021) Transparency | Include in the NIR the data source and actual ratio of distribution of diesel consumption between off-road machinery and stationary combustion. | Not resolved. The Party did not include in the NIR the data source and ratio of diesel consumption between off-road machinery and stationary combustion. During the review, the Party indicated that it will consider addressing this recommendation for the next annual submission. |
| E.5 | Feedstocks, reductants and other non-energy use of fuels – lubricants (E.13, 2021) Convention reporting adherence | Report lubricant use AD and excluded CO ₂ emissions consistently between the IPPU sector and the reference approach under the energy sector. | Resolved. The Party reported lubricant use under the reference approach in CRF table 1.A(d) consistently with the lubricant use AD reported in CRF table 2(I).A-H (sheet 2). |
| E.6 | 1.B.1.a Coal mining and handling – solid fuels – CH ₄ (E.9, 2021) (E.18, 2019) Accuracy | With regard to the EF for the surface mining of lignite, (1) continue exploring the possibility of conducting measurements to develop a country-specific EF and (2) initiate an analysis of the possibility of updating the EF and report on progress in the NIR. This analysis could include the age of the coal layer (very old in Greece) and its depth (very close to the surface) and correlate with the CH ₄ content of the coal layer. | Addressing. In the NIR (p.178), the Party explained that it is conducting an analysis of the possibility of updating the EF for surface mining of lignite, focusing on the age and depth of the coal layer and the correlation with its CH ₄ content. During the review, the Party provided additional information on this analysis, indicating that it is planning to include the results of the analysis in future annual submissions. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet developed a country-specific EF for surface mining of lignite and did not report on progress in conducting the analysis for updating the EF, focusing on the age and depth of the coal layer. |

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|---|---|---|
| E.7 | 1.B.1.a Coal mining and handling – CH ₄ (E.16, 2021) Comparability | Report CH ₄ emissions from surface mining activities and post-mining activities separately in CRF table 1.B.1. | Not resolved. The Party did not report CH ₄ emissions from surface mining activities and post-mining activities separately in CRF table 1.B.1. During the review, the Party indicated that it will consider addressing this recommendation for the next annual submission. |
| IPPU | | | |
| I.1 | 2. General (IPPU) – CO ₂ , CH ₄ , PFCs and HFCs (I.15, 2021) Convention reporting adherence | Correct the typographical errors in the CRF tables. | Resolved. The Party corrected the typographical errors and reported the correct AD for aluminium production (category 2.C.3) in CRF table 2(I).A-H (sheet 2) and for limestone consumption (category 2.A.4 – other process uses of carbonates) in CRF table 2(I).A-H (sheet 1) for 2019. |
| I.2 | 2.C.3 Aluminium production – PFCs (I.16, 2021) Comparability | Reallocate PFC emissions from anode effects to by-product emissions. | Not resolved. The Party continued to report CF ₄ and C ₂ F ₆ emissions from aluminium production under F-gases used in foundries. During the review, the Party indicated that the recommended change will be made for the next annual submission. |
| I.3 | 2.C.5 Lead production – CO ₂ (I.6, 2021) (I.4, 2019) (I.13, 2017) Transparency | Explain the changes in the CO ₂ IEF values for lead production by including in the NIR information on the changes in lead production across the time series. | Resolved. The Party reported in its NIR (p.246) information on changes in lead production, the EFs used and related emissions for 1990–2020. The ERT considers that the information provided adequately explains the observed changes in the CO ₂ IEF values. |
| I.4 | 2.C.5 Lead production – CO ₂ (I.17, 2021) Accuracy | Correct the estimates of CO ₂ emissions from lead production for 2011–2019 by using the correct AD that incorporate revisions by the AD source provider to primary lead production. | Resolved. The Party reported in its NIR (p.248) the recalculation of CO ₂ emissions from lead production for 2011–2019 using the correct AD provided by the United States Geological Survey. On the basis of the updated AD, the amount of lead production decreased compared with the previous year, leading to lower recalculated emissions than for previous years. |
| I.5 | 2.F.1 Refrigeration and air conditioning – HFCs (I.10, 2021) (I.6, 2019) (I.3, 2017) (I.6, 2016) (I.6, 2015) (48, 2014) Transparency | Improve the transparency of the NIR by including information similar to that provided to the ERT during the review on assumptions used in calculating emissions from refrigeration and air-conditioning equipment, including a plan for periodically verifying the expert judgment, because production and operating standards change over the years. | Resolved. In the NIR (p.270), the Party included information on the assumptions used in calculating emissions from refrigeration and air-conditioning equipment, as well as information on planned improvements for periodically verifying the expert judgment (p.284). Specifically, the Party has launched a web platform for maintenance and monitoring of F-gases and ozone-depleting substances, which will include data for 2019 onward. This effort marked a significant improvement from previous years. The platform will be used to gather primary AD directly from all F-gas users and traders. However, since the database for the web platform was not completed at the time of the 2022 submission, the Party used a database of ICAP (a services group in Greece) surveys instead. |
| I.6 | 2.F.2 Foam blowing agents – HFC-134a and HFC-152(es) | Provide information in the NIR on equipment lifetimes, which should be based on the commencement of the consumption of HFC-containing foam products and the IPCC | Resolved. The Party provided information in its NIR (p.277) explaining that disposal emissions were reported as “NO” in the respective CRF tables given that the default 20-year product lifetime means that 2021 will be the first year in which these emissions will occur. |

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|--|--|
| | (I.18, 2021) Transparency | default product lifetime of 20 years, in order to justify that no emissions from disposal are being reported. | |
| I.7 | 2.F.3 Fire protection – HFCs (I.19, 2021) Transparency | Revise the notation keys used for reporting manufacturing and disposal of HFC-227ea from fire protection and other F-gases from “NO” to “IE” and provide an explanation for the use of this notation key in the NIR and CRF table 9. In addition, provide a detailed explanation of the approach to deriving the per capita EF, including how the use of F-gas propellants other than HFC-227ea is considered. | Not resolved. In CRF table 2(II)B-H (sheet 2), the Party reported only emissions from stocks and continued to report those from manufacturing and disposal as “NO”. Furthermore, the Party did not include in the NIR a detailed explanation of its approach to deriving the per capita EF. During the review, the Party explained that although it took into account emissions from manufacturing and disposal of HFC-227ea when deriving a per capita EF for fire protection equipment, it reported emissions from manufacturing and disposal as “NO” instead of as “IE” in CRF table 2(II).B-H (sheet 2). The Party added that it will report manufacturing and disposal of HFC-227ea from fire protection as “IE” instead of “NO” in the next annual submission. Furthermore, the Party added that it had already clarified during the previous review that HFC-227ea is the only F-gas reported for this category, and that the F-gases other than HFC-227ea reported by neighbouring countries are HFC-125 and HFC-236fa (which are reported by some neighbouring countries only, and the associated emissions in Greece are negligible compared with the total emissions for this category) and HFC-23 (which is prohibited as of 1 January 2016 under EU regulation 517/2014). For the above reasons, the Party reported in the inventory only HFC-227ea emissions from fire protection. The Party also explained that the estimate of average HFC-227ea per capita emissions from fire equipment was based on the per capita emissions of Italy, Spain and Portugal. The ERT considers that the recommendation has not yet been addressed because the Party has not yet revised the notation keys in the NIR and provided an explanation for their use. In addition, the Party has not yet included in the NIR a detailed explanation of its approach to deriving the per capita EF, including how the use of F-gases other than HFC-227ea is considered. |
| I.8 | 2.G.3 N ₂ O from product uses – N ₂ O (I.13, 2021) (I.12, 2019) (I.14, 2017) Accuracy | Estimate and report N ₂ O emissions from product uses using the methodology provided in the 2006 IPCC Guidelines and on the basis of the total amount of N ₂ O supplied in a year. | Not resolved. The Party reported N ₂ O emissions from product uses by applying the country-specific methodology, as in the previous annual submission. During the review, the Party clarified that there are insufficient data to apply the methodology from the 2006 IPCC Guidelines (vol. 3, chap. 8) since information on the total N ₂ O supplied for medical applications, propellant use in aerosol products and/or other product uses is not available in the national statistics. As no primary data were provided by manufacturers and distributors, the Party used average N ₂ O emissions per capita for other EU countries as a driver. Although this method is not in line with the 2006 IPCC Guidelines, the Party used it to calculate emissions for both the base year and the reporting year. The IEF reported in CRF table 2(I).A-H (sheet 2) for 1990 and subsequent years is 0.000022 t N ₂ O per capita. Using this method and this IEF consistently across the time series leads to comparable estimates and therefore the ERT considered that this issue does not result in a potential underestimation of N ₂ O emissions under the Kyoto Protocol. |

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|--------------------|--|--|--|
| Agriculture | | | |
| A.1 | 3.A.1 Cattle – CH ₄ and N ₂ O (A.12, 2021) Transparency | Correct in the NIR the C _a coefficient used for estimating energy used for acquiring feed in the different periods. In addition, clarify in the NIR whether the assumption that 8 per cent of dairy cattle manure is deposited on pasture, range and paddock is linked to the assumption that dairy cattle spend a portion of their time on pasture in the summer months. | Not resolved. The Party reported in its NIR (section 5.2.2, p.302) that a C _a coefficient equal to 0 was used for estimating net energy for dairy cattle activity, considering that dairy cattle are confined to a small area and thus no energy is required to acquire feed. However, the Party further indicated in the NIR (section 5.3.2, p.313) that 8 per cent of dairy cattle manure is deposited on pasture, range and paddock during the grazing period. During the review, the Party explained that, for estimating net energy for dairy cattle activity, different feeding situations were considered for the period in which dairy cattle live on farms (C _a = 0) and for the period in which they are on paddock or pasture (C _a = 0.17). The Party also explained that these assumptions will be corrected for the next annual submission. The ERT considers that the recommendation has not yet been resolved because the Party has not yet reported correct information on the parameters used for estimating CH ₄ emissions from enteric fermentation for dairy cattle. |
| A.2 | 3.A.1 Cattle – CH ₄ and N ₂ O (A.13, 2021) Transparency | Obtain documented evidence to confirm the estimate of 600 kg for the average body weight of dairy cattle and include in the NIR references to the sources of such evidence. | Resolved. The Party reported updated data for the average body weight of dairy cattle for 1990–2020 and provided clear references in the NIR (pp.300–301). The data were estimated using linear regression of default data on weight and corresponding milk productivity from the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10A.1, p.10.72). |
| A.3 | 3.B Manure management – N ₂ O (A.4, 2021) (A.10, 2019) (A.12, 2017) (A.7, 2016) (A.7, 2015) (61, 2014) Transparency | Provide all the N ₂ O EFs and parameters used for calculating N ₂ O emissions, for example in tabular format. | Addressing. In the NIR (table 5.19, p.317), the Party provided data on N excretion rates per animal type, as well as the EFs used for estimating direct and indirect N ₂ O emissions from manure management (p.318). However, the Party did not include data on or references for the fraction of N leached during manure storage. During the review, the Party explained that the default values from the 2006 IPCC Guidelines (vol. 4, chap. 10, tables 10.22 and 10.23, pp.10.65 and 10.67 respectively) were used to calculate the data on the fraction of N that is leached, and provided the related data on manure management by animal type. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet provided in the NIR information on all the parameters used for calculating N ₂ O emissions from manure management, in particular data on or references to the fraction of N that is leached during manure storage. |
| A.4 | 3.B.4 Other livestock – CH ₄ (A.7, 2021) (A.21, 2019) Transparency | Provide in the relevant table of the NIR a reference to the EF from the 2006 IPCC Guidelines (vol. 4, table 10.14) used for estimating CH ₄ emissions from manure management for buffalo, and include in the NIR the detailed explanation regarding the EF provided to the ERT during the review. | Addressing. The Party provided in the NIR (table 5.18) a reference to the EF from the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10.14, p.10.37) used for estimating CH ₄ emissions from manure management for buffalo, but did not provide a rationale for the choice of the default EF used. During the review, the Party clarified that it used the default EF for Eastern Europe for buffalo (9 kg CH ₄ /head/year, at an average annual temperature of 18 °C) because the solids-based systems predominantly used for the management of buffalo manure in Greece are more similar to those used in Eastern Europe rather the liquid/slurry and pit storage systems commonly used for the management of cattle manure in Western Europe. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet provided |

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| A.5 | 3.D.a Direct N ₂ O emissions from managed soils – N ₂ O (A.8, 2021) (A.14, 2019) (A.15, 2017) (A.19, 2016) (A.19, 2015) Transparency | Include a detailed explanation of the method used to estimate the amount of N applied to soils from each source (animal manure applied to soils and N in crop residues returned to soils), and include the equations used to estimate direct N ₂ O emissions from managed soils. | in the NIR an explanation of the approach for selecting the EF for manure management for buffalo. Addressing. The Party provided in the NIR an explanation of the method used to estimate the amount of N applied to soils from synthetic fertilizer and organic additions and manure deposited during grazing, and provided information on the parameters used for estimating N applied from crop residues (NIR table 5.29). However, the Party did not provide any references for the method used. In addition, the NIR (p.325) contains an incorrect statement regarding the use of the equation for estimating direct N ₂ O emissions from synthetic fertilizers (the equation for estimating direct N ₂ O emissions from N inputs with additions to soils and from cultivation of histosols was provided instead). During the review, the Party provided accurate information on the methods applied to all subcategories under direct N ₂ O emissions from managed soils, clarifying that IPCC tier 1 methodology was applied for all emission estimates. The ERT considers that the recommendation has not yet been fully addressed because the Party has not included in the NIR correct information on the methods used for estimating direct N ₂ O emissions from managed soils. |
| A.6 | 3.F Field burning of agricultural residues – CH ₄ and N ₂ O (A.11, 2021) (A.24, 2019) Transparency | Include in the NIR information on the amount of dry matter burned by crop type and estimate CH ₄ and N ₂ O emissions from the field burning of agricultural residues using the EFs provided in the 2006 IPCC Guidelines (vol. 4, table 2.5). | Resolved. The Party estimated CH ₄ and N ₂ O emissions from field burning of agricultural residues using the methodologies from the <i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i> and the <i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i> and clearly explained in the NIR (section 5.7.2) that it did so owing to the unavailability of data in the national statistics on the areas of crops burned. The Party also reported data on the amount of dry matter burned by crop type in the NIR (table 5.33, p.535). Taking into account that the Party transparently documented all parameters used in the calculations, as well as the unavailability of statistical or other reliable data on areas of crops burned annually, which are required for the application of methods provided in the 2006 IPCC Guidelines, the ERT considered that Party's approach to estimating CH ₄ and N ₂ O emissions from burning of agricultural crop residues is more accurate, given the national circumstances. However, the ERT raised a follow-up question (see ID# A.13 in table 5) related to the incomplete list of crops covered by the inventory estimates. |
| A.7 | 3.G Liming – CO ₂ (A.14, 2021) Transparency | Provide documented evidence and relevant references in the NIR to prove that liming is not practised in the country and include a reference for the evidence in the NIR. | Not resolved. The Party did not report emissions from liming, explaining in the NIR (section 3.8, p.337) that CO ₂ emissions from liming do not occur since neither limestone nor dolomite is applied for agricultural purposes in Greece. However, the Party did not provide in the NIR documented evidence that liming is not practised in the country. During the review, the Party clarified that the information that liming is not practised in the country was provided by the Pan-Hellenic Association of Professional Producers and Dealers of Fertilizer, the most relevant data provider in relation to information on fertilizers in the national inventory team, which confirmed that neither limestone nor dolomite is used in Greece for agricultural purposes. The ERT considers that the |

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| | | | recommendation has not yet been addressed because the Party has not yet included in the NIR such evidence that liming does not occur in Greece. |
| LULUCF | | | |
| L.1 | 4. General (LULUCF) – (L.1, 2021) (L.8, 2019) Transparency | Include in the NIR information on planned improvements for the LULUCF sector. | Resolved. The Party reported in its NIR (chap. 6, pp.349–351) the improvements already made as well as planned improvements for the LULUCF sector. |
| L.2 | Land representation – all gases (L.17, 2021) Convention reporting adherence | Include in the NIR the corrected land-use matrix tables for 2018–2019 provided to the ERT during the review, which are consistent with CRF tables 4.1 and 4.A, paying particular attention to the values for forest land remaining forest land and cropland and grassland converted to forest land. | Resolved. The Party reported in its NIR (p.355) the corrected land-use matrix tables for 2018–2019 provided to the ERT during the review of the 2021 submission, which are consistent with CRF tables 4.1 and 4.A, including for forest land remaining forest land and cropland and grassland converted to forest land. |
| L.3 | 4.A Forest land – all gases (L.18, 2021) Convention reporting adherence | Update in the NIR the reported area of managed forest for 2019, such that it is consistent with the area reported in the CRF tables and enhance the QA/QC procedures to ensure consistency between the data reported in the NIR and the CRF tables. | Addressing. In its NIR (p.348), the Party indicated that it has improved its QA/QC procedures to ensure consistency between the data reported in the NIR and the CRF tables. However, the Party continued to report inconsistent data on the area of managed forest for 2019 (1,262 kha in its NIR, p.359, and 1,281 kha in CRF table 4.1). |
| L.4 | 4.A.1 Forest land remaining forest land – CO ₂ (L.5, 2021) (L.9, 2019) Transparency | Include in the NIR disaggregated information on forests from the FMP database that is relevant for the GHG inventory, such as a general description of the forest together with information on purpose, parameters, planning and products, and provide a link to the web-based tool for the FMP database or any central database containing the FMP maps once they become available. | Addressing. The Party reported in its NIR (p.350) that official disaggregated information on forests and forest areas will be collected during the preparation of the national inventory and the development of a monitoring system for forests and forest areas. The planned project involves compiling a detailed inventory of forests and forest areas in Greece and creating a permanent network of monitoring plots, applying biotic and abiotic parameters for assessing the impact of climate change on forests. The corresponding database is expected to become available in 2023. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet included in the NIR the recommended information. |
| L.5 | 4.A.1 Forest land remaining forest land – CO ₂ (L.7, 2021) (L.11, 2019) Accuracy | Use 1985 as the starting year in order to calculate, by interpolation and extrapolation, more accurate areas of forest land remaining forest land; use the areas calculated to develop land-transition matrices; and use these land-use change matrices in the QC activities for the LULUCF sector. | Addressing. The Party reported in its NIR (p.350) that the planned inventory improvements include using 1985 as the starting year in order to calculate, by interpolation and extrapolation, more accurate areas of forest land remaining forest land; using the areas calculated to develop land-transition matrices; and using these land-use change matrices in the QC activities for the LULUCF sector. The Party explained in its NIR (p.349) that the improvements were planned for the 2022 submission but have been postponed until 2023 owing to the need to collect more data. The ERT considers that the recommendation has not yet been fully addressed because the recommended changes have not yet been implemented in the NIR. |

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| L.6 | 4.A.1 Forest land remaining forest land – CO ₂ (L.8, 2021) (L.12, 2019) Transparency | Include in the NIR updated information on efforts to generate accurate information on forest areas in the country. | Resolved. The Party reported in its NIR (p.350) that efforts to generate accurate information on forest areas in the country are planned. Official disaggregated information on forests and forest areas will be collected during the preparation of the national inventory and a monitoring system for forests and forest areas will be developed. The planned project involves compiling a detailed inventory of forests and forest areas in Greece and creating a permanent network of monitoring plots, applying biotic and abiotic parameters for assessing the impact of climate change on forests. The corresponding database is expected to become available in 2023. |
| L.7 | 4.A.2.1 Cropland converted to forest land – CO ₂ (L.3, 2021) (L.2, 2019) (L.6, 2017) (L.9, 2016) (L.9, 2015) Accuracy | Use EFs instead of IEFs from Italy and apply the method provided in the 2006 IPCC Guidelines to improve accuracy for cropland converted to forest land. | Addressing. The Party reported in its NIR (p.350) that using country-specific EFs instead of IEFs from Italy and applying the method provided in the 2006 IPCC Guidelines (vol. 4, chap. 4) are part of the planned inventory improvements. During the review, the Party further clarified that such changes will be implemented for the next annual submission. The ERT considers that the recommendation has not yet been fully addressed because although the Party is collecting data on afforestation projects to develop country-specific EFs, it is still using IEFs from Italy and is not yet applying the method provided in the 2006 IPCC Guidelines. |
| L.8 | 4.A.2.1 Cropland converted to forest land – CO ₂ (L.9, 2021) (L.13, 2019) Accuracy | Make efforts to develop country-specific EFs to estimate CSCs in living biomass for cropland converted to forest land. Pending the development of such country-specific EFs, investigate the appropriateness of the IEFs chosen from Italy for estimating the CSCs in living biomass for cropland converted to forest land, including by making efforts to obtain the relevant IEFs for cropland converted to forest land in Italy subject to EEC regulations 2080/92 and 1257/99, and report on such efforts in the NIR. | Addressing. Regarding the development of country-specific EFs, the Party reported in its NIR (p.350) that the recommended changes are part of the planned inventory improvements. The Party also clarified that relevant data are currently being gathered from institutions that are working on this issue, such as the Department of Forestry and Management of the Environment and Natural Resources at the Democritus University of Thrace, the Forest Research Institute and the Institute of Mediterranean Forest Ecosystems and Forest Products Technology. During the review, the Party further indicated that the appropriateness of the IEFs from Italy will be investigated for future NIRs and efforts to obtain the relevant IEFs for cropland converted to forest land in Italy subject to EEC regulations 2080/92 and 1257/99 will be made and reported on in the NIR. The ERT considers that the recommendation has not yet been fully addressed because, despite having initiated efforts, the Party has not yet developed country-specific EFs to estimate CSCs in living biomass for cropland converted to forest land, or investigated the appropriateness of the IEFs chosen from Italy for estimating the CSCs in living biomass for cropland converted to forest land, or obtained the relevant IEFs for cropland converted to forest land in Italy. |
| L.9 | 4.B.1 Cropland remaining cropland – CO ₂ (L.10, 2021) (L.14, 2019) Transparency | Include in the NIR information on the methodological changes made in 2014 to the collection of data that resulted in an increase in the estimated area under cropland remaining cropland, as well as updated information on the changes to the methodology for data collection currently being implemented. | Resolved. The Party included information in the NIR (section 6.4.2.2, p.383) on the methodological changes made in 2014 to the collection of data that resulted in an increase in the estimated area under cropland remaining cropland. |

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| L.10 | 4.B.1 Cropland remaining cropland – CO ₂ (L.11, 2021) (L.15, 2019) Completeness | Report in CRF table 4.B the CSCs in the SOC pool in mineral soils for cropland remaining cropland. | Addressing. The Party did not report in CRF table 4.B the CSCs in the SOC pool in mineral soils for cropland remaining cropland. In the section of the NIR on planned improvements (p.349), the Party indicated that data on changes between land use and management regimes are not readily available and should be investigated. During the review, the Party also explained that preliminary estimates of SOC in mineral soils for cropland remaining cropland were calculated using equation 2.25 in the 2006 IPCC Guidelines (vol. 4, chap. 5). The Party used the default values for SOC _{REF} in table 2.3 of the 2006 IPCC Guidelines (vol. 4, chap. 2, p.2.31) and the relative stock change factors in table 5.5 of the 2006 IPCC Guidelines (vol. 4, chap. 5, p.5.17). The preliminary estimates indicate that the CSCs in this pool are insignificant (below 0.05 per cent of the national total GHG emissions). The estimates were based on the assumption that all cropland, excluding orchards and land set aside, are long-term cultivated areas under full tillage. However, the Party mentioned that no geospatial data were taken into consideration to assess the areas under different tillage management or crop rotation over a period of 20 years. The Party is planning to combine data from the Greek Payment Authority of Common Agricultural Policy Aid Schemes with CORINE land cover data sets in order to track crop rotation and tillage management. The Party indicated that an update on the status of implementation of this plan will be provided in the next NIR. The ERT considers that the recommendation has not yet been fully addressed because although efforts are under way to estimate the CSCs in the SOC pool in mineral soils for cropland remaining cropland, the Party has not yet reported the recommended information. |
| L.11 | 4(V) Biomass burning – all gases (L.19, 2021) Accuracy | Correct the estimates of CO ₂ , CH ₄ and N ₂ O emissions reported for 2019 in CRF table 4(V) and enhance the QA/QC procedures to ensure that correct data are reported in the CRF tables. | Resolved. The Party reported correct estimates of CO ₂ , CH ₄ and N ₂ O emissions for 2019 in CRF table 4(V), which corrected the IEFs reported in the table. The Party enhanced its QA/QC procedures to ensure that correct data were reported in the CRF tables following internal audits. |
| L.12 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O (L.13, 2021) (L.16, 2019) Transparency | Correctly present in the NIR the equation from the 2006 IPCC Guidelines (vol. 4, equation 2.14) used to estimate carbon loss in living biomass from wildfires by including the correct set of parameters. | Resolved. The Party reported in its NIR (p.365) the correct equation from the 2006 IPCC Guidelines (vol. 4, equation 2.14) used to estimate carbon loss in living biomass from wildfires. The Party also reported in its NIR on the input parameters used, providing accompanying explanations and references that were missing from the previous annual submission. |
| L.13 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O (L.14, 2021) (L.17, 2019) Transparency | Provide in the NIR a reference to the correct parameter (combustion factor) and its values from the 2006 IPCC Guidelines (vol. 4, table 2.6) used to estimate carbon loss in living biomass from wildfires. | Resolved. The Party reported in its NIR (table 6.10, pp.365–366) the set of parameters and related information and corrected references (section 6.3.2, p.366) to the combustion factors used for estimating carbon loss in living biomass from wildfires. The ERT considers that the issue has therefore been resolved. |
| L.14 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O | Provide in the NIR (1) the specific default values for BCEF and the ratio of below-ground biomass to above-ground biomass | Resolved. The Party provided in the NIR (table 6.8 and pp.361–362) the specific default values for BCEF and the ratio of below-ground biomass to above-ground biomass used. In its NIR, the Party also explained the rationale for using default values for BCEF for |

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| | (L.15, 2021) (L.18, 2019) Transparency | from the 2006 IPCC Guidelines (vol. 4, tables 4.4–4.5) used to calculate the average biomass stock of understorey vegetation in order to calculate, in turn, carbon loss in living biomass from wildfires; and (2) an explanation as to why default values for BCEF from the 2006 IPCC Guidelines were used for calculating emissions from biomass burning of understorey vegetation, even though BCEF values for Mediterranean species from Catalonia (NIR table 6.8) were used for calculating CSCs in living biomass. | Mediterranean species from Catalonia (NIR table 6.9, p.361) to calculate carbon loss in living biomass for both forest land remaining forest land and land converted to forest land, noting that national expansion factors have not been developed in Greece. |
| L.15 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O (L.16, 2021) (L.19, 2019) Accuracy | Explore the possibility of collecting information on the burned areas of managed forest land from the Official Government Gazette, including by making efforts to store maps of burned areas in a unified database, and use this information to calculate the emissions from biomass burning due to wildfires in managed forest land, as well as report on such efforts in the NIR. | Addressing. The Party reported in its NIR (p.350) that the possibility of collecting information on the burned areas of managed forest land from the Official Government Gazette is being explored. In its NIR, the Party indicated that more than 500 Official Government Gazettes are published every year on burned areas of forest land, which may include one or more sites; however, it is not clear whether these areas are managed or if there has been any action to overrule the decision on reforestation. Therefore, the data need to be cross-checked by the local forest service against the information provided by the Greek Fire Service and the Ministry of Environment and Energy on the total burned area in the country each year. The Party also indicated that in August 2021, the Government announced that the forest services of seven decentralized administrations would be transferred directly under the management of the Ministry of Environment and Energy by the end of 2021 (although this change had not been completed as at May 2022). This change may facilitate the collection of the necessary information in a centralized database at the Ministry of Environment and Energy. During the review, the Party explained that the geospatial data and corresponding database will be reviewed to determine how they can be utilized in the NIR (reference period, completeness, etc.), and that an update on the results will be provided in the next NIR. |
| L.16 | 4.G HWP – CO ₂ (L.12, 2021) (L.5, 2019) (L.8, 2017) Consistency | Provide in the NIR a transparent explanation for the large inter-annual variations in the estimates of removals from HWP produced and consumed domestically (particularly between 1998 and 1999, 1999 and 2000, and 2008 and 2009), including the reasons for the inter-annual variations in the inflows and outflows of sawnwood and wood panels responsible for those variations. | Not resolved. The Party has not performed recalculations for the category since the 2019 submission, which continued to show significant inter-annual changes between 1998 and 1999, 1999 and 2000, and 2008 and 2009. However, in the NIR (p.350), the Party indicated that data on HWP were updated with more recent information from FAO for 2017, 2018 and 2019. However, the Party did not provide a transparent explanation for the large inter-annual variations in the estimates of removals from HWP produced and consumed domestically. The Party indicated in the NIR (section 6.10 and pp.350–351) that it will investigate HWP data on production and consumption to enable a more comprehensive interpretation of the trend in net emissions for this pool. This investigation will also provide a transparent explanation for the large inter-annual variations in the estimates of removals from HWP produced and consumed domestically |

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| | | | (particularly between 1998 and 1999, 1999 and 2000, and 2008 and 2009), including the reasons for the inter-annual variations in the inflows and outflows of sawnwood and wood panels responsible for those variations. |
| Waste | | | |
| W.1 | 5.A Solid waste disposal on land – CH ₄ (W.4, 2021) (W.5, 2019) (W.6, 2017) (W.9, 2016) (W.9, 2015) Transparency | Improve the documentation of the justifications for (1) the share of putrescibles, which is assumed to decrease by 0.3 per cent annually; (2) the share of paper and plastics, which is assumed to increase by 0.2 per cent annually; and (3) the share of garden waste, park waste and other non-food organic putrescibles, wood and textiles, which is assumed to be constant. | Addressing. The Party included in its NIR references to the legal documents used to define the assumptions underpinning the waste composition used. However, the Party did not provide additional information to justify the trends in the time series for (1) the share of putrescibles and its variation across the time series, including the assumed decrease of 0.3 per cent in 1990–1997 and 0.23 per cent in 1998–2019; (2) the share of paper and plastics, including the assumed increase of 0.2 per cent annually; and (3) the share of other waste such as garden and park waste, which is assumed to be constant throughout the time series. During the review, the Party reported that it will consider including further justification in the next annual submission. |
| KP-LULUCF | | | |
| KL.1 | General (KP-LULUCF) – all gases (KL.3, 2021) Transparency | Include in the NIR and CRF table 4(KP-I) A.1 the corrected land-matrix tables for 2018–2019 provided to the ERT during the review, which are consistent with CRF tables 4.1 and 4.A. | Resolved. The Party reported in its NIR (p.355) the corrected land-use matrix tables for 2018–2019 provided to the previous ERT during the review of the 2021 submission, which are consistent with CRF tables 4.1 and 4.A (see also ID# L.2 above). |
| KL.2 | General (KP-LULUCF) – all gases (KL.4, 2021) Transparency | Include information on how double counting has been avoided in the estimates reported for FM and basic wood density for the living biomass pool. | Resolved. The Party reported in its NIR (p.471) information on how double counting was avoided in the estimates reported for FM and basic wood density for the living biomass pool. |
| KL.3 | General (KP-LULUCF) – CO ₂ (KL.5, 2021) Transparency | Include information in the next annual submission on how double counting was avoided for the estimates reported for FM and AR for the living biomass pool. | Resolved. The Party reported in its NIR (p.471) information on how double counting was avoided for the estimates reported for FM and AR for the living biomass pool. |
| KL.4 | General (KP-LULUCF) – all gases (KL.6, 2021) KP reporting adherence | Provide in the NIR the information required by decision 2/CMP.8, annex II, paragraph 2(g)(iv). | Resolved. The Party reported in its NIR (p.494) that it did not exclude emissions from the HWP pool accounted for in the first commitment period on the basis of instantaneous oxidation from the accounting for the second commitment period, and that there was therefore no such information to provide. The Party included in the NIR (p.492) an explicit reference to the information required under decision 2/CMP.8, annex II, paragraph 2(g)(iv). |
| KL.5 | General (KP-LULUCF) – all gases (KL.7, 2021) KP reporting adherence | Provide in the NIR the information required by decision 2/CMP.8, annex II, paragraph 2(g)(vi), namely on how CO ₂ emissions from HWP in SWDS and wood logged for energy | Resolved. The Party clarified in its NIR (section 9.4.5, p.487) that CO ₂ emissions from HWP in SWDS and from wood harvested for energy purposes were not included under KP-LULUCF. The ERT considers that this is in line with the reporting requirements. During the review, the Party indicated that, as stated in the NIR (section 9.5.2.4, p.495, and section 6.10, p.409), the same methodology was applied for estimating emissions |

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| | | purposes have been accounted on the basis of instantaneous oxidation. | from HWP for the reporting under the Convention and under the Kyoto Protocol. The AD for all three HWP categories reported (sawnwood, wood-based panels, and paper and paperboard) were obtained from FAOSTAT data on production, imports and exports from 1961 onward. |
| KL.6 | FM – all gases (KL.8, 2021) KP reporting adherence | Include in the NIR the information required by decision 2/CMP.8, annex II, paragraphs 5(g)(i–iv). | Resolved. The Party reported in its NIR (p.488) that it does not apply the provision on carbon equivalent forests, as described in decision 2/CMP.7, annex, paragraphs 37–39, and consequently it does not include, under FM, emissions and removals resulting from the harvest and conversion of forest plantations to non-forest land. Therefore, the Party did not provide the information required by decision 2/CMP.8, annex II, paragraphs 5(g)(i–iv) and included an explicit reference to that information. |
| KL.7 | FM – all gases (KL.9, 2021) Transparency | Provide a concise explanation of the major drivers affecting the trend in net emissions under FM as compared with what was assumed in the FMRL, and of how the accounted quantity is the result of deviations in actual policies compared with those historical policies included in the FMRL. | Resolved. The Party reported in its NIR (p.505) that the accounted quantity is the result of deviations in actual policies compared with historical policies included in the FMRL. On the basis of the information reported in the NIR, the ERT was able to identify deforestation and wildfires as the major drivers affecting the trend in net emissions. |
| KL.8 | AR – CO ₂ (KL.1, 2021) (KL.4, 2019) Accuracy | Investigate the appropriateness of the IEFs chosen from Italy for estimating the CSCs in living biomass in land subject to AR, including by making efforts to obtain the relevant IEFs for cropland converted to forest land in Italy subject to EEC regulations 2080/92 and 1257/99, and report on such efforts in the NIR. | Addressing (see also ID# L.8 above). The Party indicated in the NIR (p.368) that in the absence of country-specific data on annual losses in carbon stocks in living biomass in land subject to AR, and on the basis of the work carried out in the context of an EU project on providing assistance to member States in reporting under the Kyoto Protocol, the Party decided to use EFs from Italy. An average value was applied for each year during 1990–2019 from the most recently updated IEFs for four Italian regions, namely Abruzzo, Molise, Basilicata and Puglia. Those specific four regions were selected because they had the most similar climatic and ecological conditions to Greece. The Party further explained in its NIR (p.350) that it will make efforts to obtain the relevant EFs for cropland converted to forest land (reported as AR) in Italy subject to EEC regulations 2080/92 and 1257/99 instead of the IEFs currently used. During the review, the Party clarified that the IEFs chosen from Italy refer to growing conditions that are similar to those in Greece and include afforestation activities under EEC regulations 2080/92 and 1257/99, as reported in the 2019 NIR of Italy (p.327). The ERT concluded that this finding does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and hence did not include this issue in the list of potential problems and further questions raised. |
| KL.9 | Biomass burning – CO ₂ , CH ₄ and N ₂ O (KL.2, 2021) (KL.5, 2019) Accuracy | Investigate the possibility of collecting AD on the burned areas in managed forest land from the Official Government Gazette, including by making efforts to store the maps of burned areas in a unified database, and use this information to estimate and | Addressing (see also ID# L.15 above). The Party reported in its NIR (p.350) that the possibility of collecting information on the burned areas in managed forest land from the Official Government Gazette is being explored. In its NIR, the Party indicated that more than 500 Official Government Gazettes on burned areas of forest land are published every year, which may include one or more sites; however, it is not clear whether these areas are managed or if there has been any action to overrule the decision on |

| <i>ID#</i> | <i>Issue/problem classification^a</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|---|---|---|
| | | report the emissions from biomass burning in land subject to AR, deforestation and FM, and report on such efforts in the NIR. | reforestation. Therefore, the data need to be cross-checked by the local forest service against the information provided by the Greek Fire Service and the Ministry of Environment and Energy on the total burned area in the country each year. The Party also indicated that in August 2021, the Government announced that the forest services of seven decentralized administrations would be transferred directly under the management of the Ministry of Environment and Energy by the end of 2021 (although this change had not been completed as at May 2022). This change may facilitate the collection of the necessary information in a centralized database. During the review, the Party further indicated that the collection of information on the burned areas of managed forest land from the Official Government Gazette requires additional resources that are not currently available. In addition, burned areas are included in the ongoing compilation of forest maps for the entire Greek territory. Once the compilation is complete, it will be managed and updated by the Greek Forest Service. The Party also explained that information collected by the General Directorate of Forests and Forest Environment of the Ministry of Environment, Energy and Climate Change of Greece (geospatial data and the corresponding database) will be reviewed prior to being used for preparing the NIR, and an update on the results of this review will be provided in the next annual submission. The ERT concludes that this potential problem of a mandatory nature does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and hence did not include this issue in the list of potential problems and further questions raised. |

^a References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) in which the issue or problem was raised. Issues are identified in accordance with paras. 80–83 of the UNFCCC review guidelines and classified as per para. 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with para. 69 of the Article 8 review guidelines in conjunction with decision 4/CMP.11.

IV. Issues and problems identified in three or more successive reviews and not addressed by the Party

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues and/or problems included in table 4 have been identified in three or more successive reviews, including the review of the 2022 annual submission of Greece, and had not been addressed by the Party by the time of publication of this review report.

Table 4
Issues and/or problems identified in three or more successive reviews and not addressed by Greece

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|------------|---|---|
| General | | |
| G.1 | Report complete information in CRF table 9. | 4 (2017–2022) |

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|--------------------|---|---|
| Energy | | |
| E.1 | Reallocate the CO ₂ and CH ₄ emissions from flaring under subcategory 1.A.1.b (petroleum refining) to subcategory 1.B.2.c (venting and flaring) while ensuring time-series consistency, given that EU ETS data are not available for before 2005. | 3 (2019–2022) |
| E.3 | Include in the NIR information on fuel consumption and EFs, disaggregated by fuel and sector, used for estimating CH ₄ and N ₂ O emissions for this category, and provide an explanation for the trend in emissions. | 3 (2019–2022) |
| E.6 | With regard to the EF for the surface mining of lignite, (1) continue exploring the possibility of conducting measurements to develop a country-specific EF; and (2) initiate an analysis of the possibility of updating the EF and report on progress in the NIR. This analysis could include the age of the coal layer (very old in Greece) and its depth (very close to the surface) and correlate with the CH ₄ content of the coal layer. | 3 (2019–2022) |
| IPPU | | |
| I.8 | Estimate and report N ₂ O emissions from product uses using the methodology provided in the 2006 IPCC Guidelines and on the basis of the total amount of N ₂ O supplied in a year. | 4 (2017–2022) |
| Agriculture | | |
| A.3 | Provide all the N ₂ O EFs and parameters used for calculating N ₂ O emissions, for example in tabular format. | 6 (2014–2022) |
| A.4 | Provide in the relevant table of the NIR a reference to the EF from the 2006 IPCC Guidelines (vol. 4, table 10.14) used for estimating CH ₄ emissions from manure management for buffalo, and include in the NIR the detailed explanation regarding the EF provided to the ERT during the review. | 3 (2019–2022) |
| A.5 | Include a detailed explanation of the method used to estimate the amount of N applied to soils from each source (animal manure applied to soils and N in crop residues returned to soils), and include the equations used to estimate direct N ₂ O emissions from managed soils. | 5 (2015/2016–2022) |
| LULUCF | | |
| L.4 | Include in the NIR disaggregated information on forests from the FMP database that is relevant for the GHG inventory, such as a general description of the forest together with information on purpose, parameters, planning and products, and provide a link to the web-based tool for the FMP database or any central database containing the FMP maps once they become available. | 3 (2019–2022) |
| L.5 | Use 1985 as the starting year in order to calculate, by interpolation and extrapolation, more accurate areas of forest land remaining forest land; use the areas calculated to develop land-transition matrices; and use these land-use change matrices in the QC activities for the LULUCF sector. | 3 (2019–2022) |
| L.7 | Use EFs instead of IEFs from Italy and apply the method provided in the 2006 IPCC Guidelines to improve accuracy for cropland converted to forest land. | 5 (2015/2016–2022) |
| L.8 | Make efforts to develop country-specific EFs to estimate CSCs in living biomass for cropland converted to forest land. Pending the development of such country-specific EFs, investigate the appropriateness of the IEFs chosen from Italy for estimating the CSCs in living biomass for cropland converted to forest land, including by making efforts to obtain the | 3 (2019–2022) |

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|------------|---|---|
| | relevant IEFs for cropland converted to forest land in Italy subject to EEC regulations 2080/92 and 1257/99, and report on such efforts in the NIR. | |
| L.10 | Report in CRF table 4.B the CSCs in the SOC pool in mineral soils for cropland remaining cropland. | 3 (2019–2022) |
| L.15 | Explore the possibility of collecting information on the burned areas of managed forest land from the Official Government Gazette, including by making efforts to store maps of burned areas in a unified database, and use this information to calculate the emissions from biomass burning due to wildfires in managed forest land, as well as report on such efforts in the NIR. | 3 (2019–2022) |
| L.16 | Provide in the NIR a transparent explanation for the large inter-annual variations in the estimates of removals from HWP produced and consumed domestically (particularly between 1998 and 1999, 1999 and 2000, and 2008 and 2009), including the reasons for the inter-annual variations in the inflows and outflows of sawnwood and wood panels responsible for those variations. | 4 (2017–2022) |
| Waste | | |
| W.1 | Improve the documentation of the justifications for (1) the share of putrescibles, which is assumed to decrease by 0.3 per cent annually; (2) the share of paper and plastics, which is assumed to increase by 0.2 per cent annually; and (3) the share of garden waste, park waste and other non-food organic putrescibles, wood and textiles, which is assumed to be constant. | 5 (2015/2016–2022) |
| KP-LULUCF | | |
| KL.8 | Investigate the appropriateness of the IEFs chosen from Italy for estimating the CSCs in living biomass in land subject to AR, including by making efforts to obtain the relevant IEFs for cropland converted to forest land in Italy subject to EEC regulations 2080/92 and 1257/99, and report on such efforts in the NIR. | 3 (2019–2022) |
| KL.9 | Investigate the possibility of collecting AD on the burned areas in managed forest land from the Official Government Gazette, including by making efforts to store the maps of burned areas in a unified database, and use this information to estimate and report the emissions from biomass burning in land subject to AR, deforestation and FM, and report on such efforts in the NIR. | 3 (2019–2022) |

^a The reports on the reviews of the 2018 and 2020 annual submissions of Greece have not yet been published. Therefore, 2018, and 2020 were not included when counting the number of successive years for this table. In addition, as the reviews of the Party's 2015 and 2016 annual submissions were conducted together, they are not considered successive reviews and 2015/2016 is counted as one year.

V. Additional findings made during the individual review of the Party's 2022 annual submission

10. Table 5 presents findings made by the ERT during the individual review of the 2022 annual submission of Greece that are additional to those identified in table 3.

Table 5
Additional findings made during the individual review of the 2022 annual submission of Greece

| <i>ID#</i> | <i>Finding classification</i> | <i>Description of finding with recommendation or encouragement</i> | <i>Is finding an issue/problem?^a</i> |
|------------|--|--|---|
| General | | No general findings additional to those included in table 3 were made by the ERT during the review. | |
| Energy | | | |
| E.8 | 1.A.2.g Other (manufacturing industries and construction) – all fuels – CO ₂ , CH ₄ and N ₂ O | <p>The Party reported in CRF table 1.A(a) (sheet 2) emissions from other manufacturing industries and construction under subcategory 1.A.2.f (non-metallic minerals) instead of under subcategory 1.A.2.g (other). The Party clarified that its reporting is in line with the UNFCCC Annex I inventory reporting guidelines and footnote 9 to CRF table 1.A(a)s4. However, the ERT noted that footnote 9 to CRF table 1.A(a)s4 states that “if detailed data are not available, Parties should include all emissions from manufacturing industries and construction not included in subcategories 1.A.2.a–1.A.2.f here” (i.e. under subcategory 1.A.2.g). The ERT also noted that Greece is the only Party included in Annex I to the Convention that reported subcategory 1.A.2.g (other) as “IE”. During the review, the Party indicated that it will consider the encouragement from the previous review report to reallocate all emissions from manufacturing industries and construction not included in subcategories 1.A.2.a–1.A.2.f to subcategory 1.A.2.g for future annual submissions.</p> <p>The ERT reiterates the encouragement from the previous review report that the Party reallocate all emissions from other manufacturing industries and construction not included in subcategories 1.A.2.a–1.A.2.f to subcategory 1.A.2.g (other) rather than subcategory 1.A.2.f (non-metallic minerals) to improve the comparability of its reporting.</p> | Not an issue/problem |
| E.9 | 1.A.4 Other sectors – all fuels – CH ₄ and N ₂ O | <p>The Party reported in its NIR (pp.121, 124 and 138) the use of default CH₄ and N₂O EFs from the 2006 IPCC Guidelines for category 1.A.4 (other sectors). However, to allow for a complete assessment of the CH₄ and N₂O emission estimates for this category, the fuel consumption and EF values disaggregated by fuel and sector should be reported (see ID# E.3 in table 3). During the review, the Party provided the AD disaggregated by fuel and sector for category 1.A.4 and the EF values, together with the reference tables from the 2006 IPCC Guidelines (vol. 2, chap. 2, table 2.4, p.2.20 (commercial/institutional) and table 2.5, p.2.22 (residential and agriculture/forestry/fishing/fishing farms)). The ERT noted that for both gases, the Party used a combination of tier 1 EFs and technology-specific (tier 3) EFs, although without providing a consistent justification. For example, for subcategory 1.A.4.c (agriculture – stationary combustion), the Party used a tier 1 default EF for N₂O and a lower EF value for CH₄ for diesel and residual fuel oil; for liquefied petroleum gas, the Party used a tier 3 EF for CH₄ and a tier 1 default EF for N₂O which was much lower than the tier 3 value. The Party clarified that in some cases the use of technology-specific EFs was possible based on expert judgment. However, the ERT noted that the expert judgment was not properly substantiated and that some of the assumptions made were inconsistent, for example</p> | Yes. Accuracy |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|------|--|---|---|
| E.10 | Feedstocks, reductants and other non-energy use of fuels | <p>regarding the choice of different tier methods (i.e. a tier 3 EF for CH₄ and a tier 1 EF for N₂O) for the same technology and fuel, such as boilers. The ERT calculated an estimate using the tier 1 default CH₄ and N₂O EFs, considering the values provided in the 2006 IPCC Guidelines for off-road mobile sources and machinery (vol. 2, chap. 3, table 3.3.1, p.3.36) and for stationary combustion (vol. 2, chap. 2, table 2.4, p.2.20 (commercial/institutional) and table 2.5, p.2.22 (residential and agriculture/forestry/fishing/fishing farms)). The ERT found that emissions had been underestimated by 19.03 kt CO₂ eq for 2020, which is below the significance threshold for application of an adjustment in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of total national emissions, or 37.4 kt CO₂ eq in 2020). Therefore, the issue was not included in the list of potential problems and further questions raised.</p> <p>The ERT recommends that the Party provide in the NIR justification to explain how the approach chosen led to an accurate estimate of the parameters applied, as well as justification for the assumptions applied in considering technology-specific tier 3 CH₄ and N₂O EFs for category 1.A.4 (other sectors). If this is not possible, the ERT recommends that the Party consider using tier 1 CH₄ and N₂O EFs until consistent justifications and assumptions can be provided in the NIR to substantiate the use of different methodological approaches.</p> <p>The Party reported CO₂ emissions from non-energy use of lubricants, petroleum coke, other bituminous coal, lignite and natural gas for 2016–2019 in CRF table 1.A(d). Emissions from non-energy use were reported in the inventory as “IE” for 1990–2015, despite the allocation of those emissions being specified in CRF table 1.A(d). The Party clarified that it continued to report emissions for 1990–2015 as “IE” owing to a lack of resources for improving its reporting in CRF table 1.A(d). During the review, the Party indicated that collecting data for 1990–2015 would require a disproportionate effort in terms of time and resources.</p> <p>The ERT reiterates the encouragement from the previous review report that the Party report correct data in CRF table 1.A(d) for CO₂ emissions from non-energy use of lubricants, petroleum coke, other bituminous coal, lignite and natural gas for 1990–2015.</p> | Not an issue/problem |
| IPPU | 2.F.2 Foam blowing agents – HFCs | <p>The Party reported in its NIR (p.277) HFC-134a emissions (first-year emissions) from foam blowing agents for 2020 as equal to 0.00 kt CO₂ eq, even though these emissions were reported with values for previous years of the time series. The ERT noted that this is not in accordance with the UNFCCC Annex I inventory reporting guidelines, because the appropriate notation key (“NO”) should be used instead of the value of 0 if no emissions occurred. During the review, the Party clarified that according to EU regulation 517/2014, extruded polystyrene foams that contain HFCs with a global warming potential value of 150 or more were banned as of 1 January 2020, except when required to meet national safety standards. Accordingly, in 2020, no new extruded polystyrene foams containing HFC-134a were introduced in the system. This explanation was also reported in the documentation box to CRF table 2(II).B-H (sheet 2). Even though the Party reported the AD for new manufactured products as “NO” in CRF table 2(II).B-H (sheet 2), the ERT noted that the cells for the IEF (product manufacturing factor) and emissions from manufacturing were left blank, with no appropriate notation keys used.</p> <p>The ERT recommends that the Party report the IEF (product manufacturing factor) and emissions from manufacturing as “NO” for 2020 in CRF table 2(II).B-H (sheet 2).</p> | Yes. Comparability |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|-------------|---|--|---|
| I.10 | 2.G.4 Other (other product manufacture and use) – CO ₂ | <p>The Party reported in its NIR (pp.290 and 292) that emissions from category 2.G.4 (other – other product manufacture and use) included emissions from ink manufacturing and that the related AD were from the Prodcop database. However, the ERT was unable to identify information on the AD for and emissions from ink manufacturing in CRF table 2(I).A-H (sheet 2). During the review, the Party clarified that the AD for ink manufacturing were from the Prodcop database. For 2020, the correct AD were 3.36 kt of ink produced and the corresponding emissions were 0.22 kt CO₂ eq. The Party indicated that an error occurred when transferring data to CRF Reporter for 2020, while data for the other years of the time series were transferred correctly, and that it will correct this error for the next annual submission. On the basis of the AD provided by the Party during the review, the ERT calculated the missing emissions from ink manufacturing for 2020 as approximately 0.23 kt CO₂ eq, or 0.0004 per cent of national total emissions, which is below the significance threshold for application of an adjustment in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of total national emissions, or 37.4 kt CO₂ eq for 2020). Therefore, the issue was not included in the list of potential problems and further questions raised.</p> <p>The ERT recommends that the Party report the missing emission estimates for ink manufacturing for 2020 in CRF table 2(I).A-H (sheet 2).</p> | Yes. Completeness |
| Agriculture | | | |
| A.8 | 3. General (agriculture) – CH ₄ and N ₂ O | <p>In the NIR, the Party indicated that CH₄ emissions from enteric fermentation (p.310), CH₄ and N₂O emissions from manure management (p.319) and N₂O emissions from agricultural soils (p.332) were recalculated for 2019, in particular owing to an update of AD. However, the Party did not clarify which data were updated and the underlying reason for the update. During the review, the Party explained that animal population data were updated for 2019 because in the 2021 submission, only preliminary data were reported for 2019 owing to a delay in the publication of official data. In the 2022 submission, the Party used the official data for 2019, following their publication by the Hellenic Statistical Authority. The ERT noted that, as a result of the recalculations, the estimates of CH₄ and N₂O emissions from these sources decreased by 0.06 per cent for 2019, amounting to 0.05 per cent of national total emissions excluding LULUCF, and therefore have no significant impact.</p> <p>The ERT recommends that the Party include in the NIR a clear description of the procedure for collecting AD on animal population, its data sources and periodicity, and the reasons for any recalculations.</p> | Yes. Transparency |
| A.9 | 3. General (agriculture) – CH ₄ and N ₂ O | <p>In the NIR (p.308), the Party indicated that livestock population data were obtained from the Hellenic Statistical Authority. However, the ERT could not identify in the NIR detailed information on the approach used to generate data on average livestock population from those national statistics. During the review, the Party clarified that data on average livestock population were derived from experts at the Hellenic Statistical Authority on the basis of statistical analysis of data on livestock population available on the last day of the year and that the data are from a survey performed annually in autumn.</p> <p>The ERT recommends that the Party include in the NIR information on the procedure for estimating average livestock population data.</p> | Yes. Transparency |

| <i>ID#</i> | <i>Finding classification</i> | <i>Description of finding with recommendation or encouragement</i> | <i>Is finding an issue/problem?^a</i> |
|------------|---|---|---|
| A.10 | 3. General (agriculture) – CH ₄ and N ₂ O | <p>The Party reported CH₄ emissions from enteric fermentation and CH₄ and N₂O emissions from manure management of other animals as “NO” in the inventory. However, the ERT noted that FAOSTAT includes data on rabbits for Greece for 1990–2020. During the review, the Party confirmed that rabbits are bred in the country and provided estimates of CH₄ and N₂O emissions from manure management based on the data available from the Hellenic Statistical Authority for 2019 (rabbit population of 782,804 head) and the default EFs and parameters from the 2006 IPCC Guidelines, namely a CH₄ EF for manure management of 0.08 kg CH₄/head/year⁻¹ and an N excretion rate of 8.1 kg N/head/year. Using these values, the total emissions from these sources were estimated as 0.06 kt CH₄ (or 1.5 kt CO₂ eq) and 0.05 kt N₂O (or 14.9 kt CO₂ eq), or 0.02 per cent of national total emissions for 2019, which is significantly lower than the threshold of significance in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of national total emissions, or 37.4 kt CO₂ eq). The Party also explained that, given that official data are not available for the whole period (1990–2020), it decided not to include this minor category in the inventory to avoid using unofficial data for the period for which the required data were not available.</p> <p>The ERT recommends that the Party change the notation key reported in the CRF tables to “NE” and describe in the NIR the reasons for not including in the inventory CH₄ emissions from enteric fermentation and CH₄ and N₂O emissions from manure management of other animals (rabbits) in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.</p> | Yes. Transparency |
| A.11 | 3.A Enteric fermentation – CH ₄ | <p>In the NIR (pp.300 and 304), the Party reported that the equations used for estimating gross energy intake for non-dairy cattle and sheep and the country-specific CH₄ EFs for enteric fermentation both accounted for net energy for growth. However, the ERT was not able to identify in the NIR either data on or sources for weight gain for growing animals. During the review, the Party provided data on weight gain per sex and age class for non-dairy cattle and sheep and clarified that the data are based on analysis conducted by other reporting Parties in the Mediterranean region, in particular Portugal and Italy.</p> <p>The ERT recommends that the Party include in the NIR the parameters and assumptions used for calculating the country-specific CH₄ EFs for enteric fermentation for non-dairy cattle and sheep, along with references to relevant sources.</p> | Yes. Transparency |
| A.12 | 3.B.4 Other livestock – CH ₄ | <p>In the NIR (table 5.18, p.316), the Party used the IPCC default EF for developed countries for poultry (layers) (equal to 0.03 kg CH₄/head) to estimate CH₄ emissions from manure management for poultry. However, the ERT noted that the Party did not clarify in the NIR whether other poultry types (broilers, turkeys and ducks) were included in the CH₄ emission estimates, for which the IPCC default values are 0.02, 0.09 and 0.03 kg CH₄/head respectively (2006 IPCC Guidelines, vol. 4, chap. 10, table 10.15, p.10.40). During the review, the Party explained that other poultry were considered in the CH₄ emission estimates and that the information provided in NIR table 5.18 will be updated for the next annual submission to reflect this. The Party also noted that the IEF for poultry reported in CRF table 3.B(a) (sheet 1) for 2020 is 0.030452 kg CH₄/head, confirming the fact that the population of poultry (layers) is significantly higher than for other poultry and results in an IEF close to 0.03 kg CH₄/head.</p> <p>The ERT recommends that the Party provide clarification in the NIR on the poultry types considered and the respective EF used in the inventory estimates.</p> | Yes. Transparency |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|------|---|---|---|
| A.13 | 3.D.a.4 Crop residues – N ₂ O | <p>In the NIR, the Party did not report a complete list of crops. Specifically, the ERT noted that the list of crops reported by the Party in NIR table 5.29 (p.329) is shorter than the one available on the web page of the Hellenic Statistical Authority on agriculture, livestock and fisheries (www.statistics.gr) for 2019, and that the following crops cultivated in Greece were not included in the inventory: sorghum, other cereals, some types of beans and pulses, vetch, bitter vetch, lupine, vetchling (lathyrus), clover seed, groundnuts, soya seed, rapeseed, vetch hay, clover (perennial) for hay, clover (annual) for hay, grass cut for hay, other grasses for hay, onions, garlic and carrots. During the review, the Party explained that it estimated N₂O emissions from crop residues for the majority of the subcategories included in the 2006 IPCC Guidelines (vol. 4, chap. 11, table 11.2, p.11.17) such as common wheat, durum wheat, barley, oats, rye, maize (grown alone), maize (grown with beans and other crops), rice, beans, peas, potatoes and sugar beet. The ERT further noted that table 11.2 of the 2006 IPCC Guidelines provides data not only for individual crops that were reported in the GHG inventory but also for aggregate estimates of major crop types such as grains, pulses, root crops, tubers and grasses. The ERT identified a possible underestimation of N₂O emissions that is higher than the threshold of significance in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of total national emissions, or 37.4 kt CO₂ eq) and therefore included this issue in the list of potential problems and further questions raised. During the review, the Party acknowledged the errors in the estimates and resubmitted a complete set of CRF tables with corrected estimates for 2013–2020. The revised estimates for the category for 2020 resulted in an increase in estimated emissions by 86.2 kt CO₂ eq, or 0.12 per cent of national total emissions. The ERT agrees with the revised estimates.</p> <p>The ERT recommends that the Party recalculate the estimates for 1990–2012 to include the revised list of crops in the estimates of N₂O emissions from crop residues for the entire time series. The ERT also recommends that the Party update the information reported on the category in the NIR, including the revised list of crops in NIR table 5.29.</p> | Yes. Accuracy |
| A.14 | 3.D.b.2 N leaching and run-off – N ₂ O | <p>In the NIR, the Party did not report a complete list of crops (see ID# A.13 above). The ERT noted that this could lead to an underestimation of N₂O emissions from N inputs to soils with crop residues that are leached. During the review, the Party provided data for the calculations of N inputs to soils with crop residues, which are required for estimating indirect N₂O emissions from leaching. The ERT identified a potential underestimation of indirect N₂O emissions from N leaching; however, as the underestimation is lower than the threshold of significance in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of national total emissions, or 37.4 kt CO₂ eq), the ERT did not include this issue in the list of potential problems and further questions raised. During the review, the Party resubmitted a complete set of CRF tables with corrected estimates for 2013–2020. The revised estimates for the category for 2020 resulted in an increase in estimated emissions by 19.4 kt CO₂ eq, or 0.03 per cent of national total emissions. The ERT agrees with the revised estimates.</p> <p>The ERT recommends that the Party recalculate the estimates for 1990–2012 to include the revised list of crops in the estimates of indirect N₂O emissions from N leaching for the entire time series and update the relevant information on the AD and performed recalculations in the NIR.</p> | Yes. Accuracy |

| <i>ID#</i> | <i>Finding classification</i> | <i>Description of finding with recommendation or encouragement</i> | <i>Is finding an issue/problem?^a</i> |
|------------|---|--|---|
| A.15 | 3.F Field burning of agricultural residues – N ₂ O | In the NIR, the Party did not report a complete list of crops (see ID# A.13 above). The ERT noted that this could lead to an underestimation of CH ₄ and N ₂ O emissions from field burning of agricultural residues. During the review, Greece provided data for the calculations of CH ₄ and N ₂ O emissions from field burning of agricultural residues. The ERT estimated that the possible missing emissions for 2019 amounted to approximately 0.65 kt CO ₂ eq, or 0.0008 per cent of national total emissions, which is lower than the threshold of significance in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (0.05 per cent of national total emissions, or 37.4 kt CO ₂ eq), and therefore did not include this issue in the list of potential problems and further questions raised. The ERT recommends that the Party report complete and correct estimates for CH ₄ and N ₂ O emissions from field burning of agricultural residues. | Yes. Accuracy |
| LULUCF | | No findings for the LULUCF sector additional to those included in table 3 were made by the ERT during the review. | |
| Waste | | No findings for the waste sector additional to those included in table 3 were made by the ERT during the review. | |
| KP-LULUCF | | No findings for KP-LULUCF additional to those included in table 3 were made by the ERT during the review. | |

^a Recommendations made by the ERT during the review are related to issues as defined in para. 81 of the UNFCCC review guidelines or problems as defined in para. 69 of the Article 8 review guidelines.

VI. Application of adjustments

11. The ERT did not identify the need to apply any adjustments for the 2022 annual submission of Greece.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. Table I.5 presents the accounting quantities for KP-LULUCF reported by Greece and the final values agreed by the ERT. The final quantities of units to be issued and cancelled are presented in table I.6.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the individual review of the Party's 2022 annual submission.

Annex I

Overview of greenhouse gas emissions and removals and data and information on activities under Article 3, paragraphs 3–4, of the Kyoto Protocol, as submitted by Greece in its 2022 annual submission

1. Tables I.1–I.4 provide an overview of the total GHG emissions and removals as submitted by Greece.

Table I.1
Total greenhouse gas emissions and removals for Greece, base year–2020
 (kt CO₂ eq)

| | <i>Total GHG emissions excluding indirect CO₂ emissions</i> | | <i>Total GHG emissions and removals including indirect CO₂ emissions^a</i> | | <i>Land-use change (Article 3.7 bis as contained in the Doha Amendment)^b</i> | <i>KP-LULUCF (Article 3.3 of the Kyoto Protocol)^c</i> | <i>KP-LULUCF (Article 3.4 of the Kyoto Protocol)</i> | |
|------------------------|--|-------------------------------|---|-------------------------------|---|--|--|-----------|
| | <i>Total including LULUCF</i> | <i>Total excluding LULUCF</i> | <i>Total including LULUCF</i> | <i>Total excluding LULUCF</i> | | | <i>CM, GM, RV, WDR</i> | <i>FM</i> |
| FMRL | | | | | | | | –1 830.00 |
| Base year ^d | 104 190.38 | 106 298.28 | NA | NA | NA | | NA | |
| 1990 | 101 342.74 | 103 450.64 | NA | NA | | | | |
| 1995 | 106 526.69 | 109 399.06 | NA | NA | | | | |
| 2000 | 124 591.03 | 126 532.37 | NA | NA | | | | |
| 2010 | 115 467.93 | 118 511.01 | NA | NA | | | | |
| 2011 | 112 397.74 | 115 528.99 | NA | NA | | | | |
| 2012 | 109 185.51 | 112 271.63 | NA | NA | | | | |
| 2013 | 101 196.29 | 102 778.45 | NA | NA | | –88.52 | NA | –1 964.66 |
| 2014 | 99 240.93 | 99 366.71 | NA | NA | | –99.61 | NA | –1 964.66 |
| 2015 | 91 809.52 | 95 528.71 | NA | NA | | –79.51 | NA | –1 953.56 |
| 2016 | 88 438.42 | 91 911.68 | NA | NA | | –82.25 | NA | –1 922.38 |
| 2017 | 92 462.26 | 95 710.71 | NA | NA | | –27.73 | NA | –1 972.71 |
| 2018 | 88 386.60 | 92 417.47 | NA | NA | | –73.27 | NA | –2 071.56 |
| 2019 | 82 641.47 | 85 707.32 | NA | NA | | –75.17 | NA | –1 999.20 |
| 2020 | 70 988.22 | 74 941.23 | NA | NA | | –33.06 | NA | –2 016.70 |

Note: Emissions and removals reported for the sector other (sector 6) are not included in the total GHG emissions.

^a The Party did not report indirect CO₂ emissions in CRF table 6.

^b The value reported in this column relates to GHG emissions from conversion of forests (deforestation) in 1990 as contained in the report on the review of the Party's report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

^c Activities under Article 3, para. 3, of the Kyoto Protocol, namely AR and deforestation.

^d “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for CO₂, CH₄ and N₂O, 1995 for HFCs, PFCs and SF₆ and 2000 for NF₃. For activities under Article 3, para. 3, of the Kyoto Protocol and FM under Article 3, para. 4, only the inventory years of the commitment period must be reported.

Table I.2

Greenhouse gas emissions and removals by gas for Greece, excluding land use, land-use change and forestry, 1990–2020

(kt CO₂ eq)

| | CO ₂ ^a | CH ₄ | N ₂ O | HFCs | PFCs | Unspecified mix of HFCs and PFCs | SF ₆ | NF ₃ |
|---|------------------------------|-----------------|------------------|--------------|--------------|-------------------------------------|-----------------|-----------------|
| 1990 | 83 438.04 | 11 155.52 | 7 481.08 | 1 182.82 | 190.26 | NA, NO | 2.93 | NA, NO |
| 1995 | 86 963.20 | 11 506.95 | 6 705.26 | 4 157.38 | 62.85 | NA, NO | 3.42 | NA, NO |
| 2000 | 102 973.17 | 11 802.44 | 6 368.83 | 5 261.86 | 122.26 | NA, NO | 3.81 | NA, NO |
| 2010 | 97 354.15 | 11 082.19 | 5 471.60 | 4 467.76 | 129.44 | NA, NO | 5.86 | NA, NO |
| 2011 | 94 505.23 | 10 936.97 | 5 223.91 | 4 747.22 | 110.53 | NA, NO | 5.13 | NA, NO |
| 2012 | 91 392.59 | 10 776.02 | 4 796.84 | 5 153.36 | 147.77 | NA, NO | 5.05 | NA, NO |
| 2013 | 81 713.26 | 10 533.54 | 4 613.42 | 5 740.51 | 172.56 | NA, NO | 5.15 | NA, NO |
| 2014 | 78 639.62 | 10 340.35 | 4 404.62 | 5 842.57 | 134.63 | NA, NO | 4.92 | NA, NO |
| 2015 | 74 927.63 | 10 145.94 | 4 331.10 | 5 999.45 | 119.52 | NO, NA | 5.06 | NO, NA |
| 2016 | 71 364.16 | 9 797.52 | 4 385.86 | 6 223.77 | 135.17 | NO, NA | 5.20 | NO, NA |
| 2017 | 74 845.05 | 10 096.52 | 4 460.60 | 6 177.73 | 125.79 | NO, NA | 5.01 | NO, NA |
| 2018 | 71 781.99 | 10 217.07 | 4 361.15 | 5 917.00 | 135.31 | NO, NA | 4.94 | NO, NA |
| 2019 | 65 756.23 | 9 991.41 | 4 353.09 | 5 464.57 | 137.10 | NO, NA | 4.92 | NO, NA |
| 2020 | 55 610.28 | 9 685.20 | 4 369.98 | 5 122.68 | 148.15 | NO, NA | 4.94 | NO, NA |
| Percentage change 1990– 2020 | –33.4 | –13.2 | –41.6 | 333.1 | –22.1 | NA | 68.6 | NA |

Note: Emissions and removals reported for the sector other (sector 6) are not included in this table.

^a Greece did not report indirect CO₂ emissions in CRF table 6.

Table I.3

Greenhouse gas emissions and removals by sector for Greece, 1990–2020

(kt CO₂ eq)

| | Energy | IPPU | Agriculture | LULUCF | Waste | Other |
|------|-----------|-----------|-------------|-----------|----------|-------|
| 1990 | 77 039.30 | 11 277.14 | 10 269.39 | –2 107.91 | 4 864.81 | NO |
| 1995 | 81 074.89 | 13 603.11 | 9 570.07 | –2 872.37 | 5 151.00 | NO |
| 2000 | 96 771.29 | 15 193.13 | 9 211.99 | –1 941.35 | 5 355.96 | NO |
| 2010 | 93 148.01 | 11 759.57 | 8 834.31 | –3 043.08 | 4 769.11 | NO |

| | <i>Energy</i> | <i>IPPU</i> | <i>Agriculture</i> | <i>LULUCF</i> | <i>Waste</i> | <i>Other</i> |
|------------------------------------|---------------|-------------|--------------------|---------------|--------------|--------------|
| 2011 | 92 027.48 | 10 387.88 | 8 576.44 | -3 131.25 | 4 537.20 | NO |
| 2012 | 88 303.56 | 11 207.11 | 8 451.28 | -3 086.12 | 4 309.69 | NO |
| 2013 | 77 926.11 | 11 942.97 | 8 500.80 | -1 582.16 | 4 408.57 | NO |
| 2014 | 74 490.58 | 12 307.11 | 8 100.47 | -125.78 | 4 468.55 | NO |
| 2015 | 71 186.14 | 11 967.30 | 7 925.61 | -3 719.19 | 4 449.66 | NO |
| 2016 | 66 966.27 | 12 498.15 | 7 936.38 | -3 473.26 | 4 510.88 | NO |
| 2017 | 70 257.34 | 12 784.89 | 7 977.41 | -3 248.44 | 4 691.07 | NO |
| 2018 | 67 303.30 | 12 383.00 | 7 892.31 | -4 030.87 | 4 838.86 | NO |
| 2019 | 61 252.94 | 11 700.79 | 7 884.76 | -3 065.85 | 4 868.83 | NO |
| 2020 | 51 622.90 | 10 485.79 | 7 951.98 | -3 953.00 | 4 880.55 | NO |
| Percentage change 1990–2020 | -33.0 | -7.0 | -22.6 | 87.5 | 0.3 | NA |

Notes: (1) Greece did not report emissions or removals for the sector other (sector 6); the corresponding cells in the CRF tables were left blank; (2) Greece did not report indirect CO₂ emissions in CRF table 6.

Table I.4

Greenhouse gas emissions and removals from activities under Article 3, paragraphs 3–4, of the Kyoto Protocol by activity, base year–2020, for Greece
(kt CO₂ eq)

| | <i>Article 3.7 bis as contained in the Doha Amendment^a</i> | <i>Activities under Article 3.3 of the Kyoto Protocol</i> | | <i>FM and elected activities under Article 3.4 of the Kyoto Protocol</i> | | | | |
|---|---|---|----------------------|--|-----------|-----------|-----------|------------|
| | <i>Land-use change</i> | <i>AR</i> | <i>Deforestation</i> | <i>FM</i> | <i>CM</i> | <i>GM</i> | <i>RV</i> | <i>WDR</i> |
| FMRL | | | | -1 830.00 | | | | |
| Technical correction | | | | 210.40 | | | | |
| Base year ^b | NA | | | | NA | NA | NA | NA |
| 2013 | | -135.85 | 47.33 | -1 964.66 | NA | NA | NA | NA |
| 2014 | | -146.89 | 47.28 | -1 964.66 | NA | NA | NA | NA |
| 2015 | | -124.41 | 44.90 | -1 953.56 | NA | NA | NA | NA |
| 2016 | | -138.41 | 56.17 | -1 922.38 | NA | NA | NA | NA |
| 2017 | | -80.13 | 52.39 | -1 972.71 | NA | NA | NA | NA |
| 2018 | | -126.49 | 53.22 | -2 071.56 | NA | NA | NA | NA |
| 2019 | | -120.64 | 45.47 | -1 999.20 | NA | NA | NA | NA |
| 2020 | | -82.22 | 49.17 | -2 016.70 | NA | NA | NA | NA |
| Percentage change base year–2020 | | | | | NA | NA | NA | NA |

Note: Values in this table include emissions from land subject to natural disturbances, if applicable.

^a The value reported in this column relates to 1990.

^b Greece has not elected to report on any activities under Article 3, para. 4, of the Kyoto Protocol. For activities under Article 3, para. 3, of the Kyoto Protocol and FM under Article 3, para. 4, only the inventory years of the commitment period must be reported.

2. Table I.5 provides information on the Party's accounting quantities for reporting under Article 3, paragraphs 3–4, of the Kyoto Protocol.

Table I.5

Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol for Greece

(kt CO₂ eq)

| GHG source/sink activity | Net emissions/removals | | | | | | | | | | Accounting parameters | Accounting quantities ^a |
|--|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------------|-----------------------|------------------------------------|
| | Base year ^b | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total ^c | | |
| A.1. AR | | -135.854 | -146.890 | -124.406 | -138.411 | -80.128 | -126.491 | -120.639 | -82.224 | -955.044 | | -955.043 |
| Excluded emissions from natural disturbances ^d | | NO | NO | NO | NO | NO | NO | NO | NO | NO | | NO |
| Excluded subsequent removals from land subject to natural disturbances | | NO | NO | NO | NO | NO | NO | NO | NO | NO | | NO |
| A.2. Deforestation | | 47.334 | 47.277 | 44.896 | 56.166 | 52.395 | 53.220 | 45.471 | 49.168 | 395.926 | | 395.926 |
| B.1. FM | | | | | | | | | | -15 865.428 | | -2 908.642 |
| Net emissions/removals | | -1 964.657 | -1 964.656 | -1 953.555 | -1 922.383 | -1 972.710 | -2 071.565 | -1 999.202 | -2 016.700 | -15 865.428 | | |
| Excluded emissions from natural disturbances ^d | | NO | NO | NO | NO | NO | NO | NO | NO | NO | | NO |
| Excluded subsequent removals from land subject to natural disturbances | | NO | NO | NO | NO | NO | NO | NO | NO | NO | | NO |

| GHG source/sink activity | Net emissions/removals | | | | | | | | | | Accounting parameters | Accounting quantities ^a |
|--|------------------------|------|------|------|------|------|------|------|------|--------------------|-----------------------|------------------------------------|
| | Base year ^b | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total ^c | | |
| Any debits from newly established forest | | NO | NO | NO | NO | NO | NO | NO | NO | NO | | NO |
| FMRL ^e | | | | | | | | | | | -1 830.000 | |
| Technical corrections to FMRL | | | | | | | | | | | 210.402 | |
| FM cap | | | | | | | | | | | 30 118.000 | -2 908.642 |
| B.2. CM (if elected) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |
| B.3. GM (if elected) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |
| B.4. RV (if elected) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |
| B.5. WDR (if elected) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |

^a The accounting quantity is the total quantity of units to be issued or cancelled for a particular activity.

^b Net emissions and removals from CM, GM, RV and/or WDR, if elected, in the Party's base year as established in decision 9/CP.2.

^c Cumulative net emissions and removals for all years of the commitment period reported in the annual submission under review.

^d The Party indicated that it does not intend to exclude emissions from natural disturbances.

^e As inscribed in the appendix to the annex to decision 2/CMP.7 in kt CO₂ eq per year.

3. Table I.6 provides an overview of key data from Greece's reporting under Article 3, paragraphs 3–4, of the Kyoto Protocol.

Table I.6

Key data for Greece under Article 3, paragraphs 3–4, of the Kyoto Protocol from its 2022 annual submission

| <i>Parameter</i> | <i>Data values</i> |
|---|--|
| Periodicity of accounting | (a) AR: commitment period accounting (b) Deforestation: commitment period accounting (c) FM: commitment period accounting (d) CM: not elected (e) GM: not elected (f) RV: not elected (g) WDR: not elected |
| Elected activities under Article 3, paragraph 4, of the Kyoto Protocol | None |
| Election of application of provisions for natural disturbances | Yes, for AR and FM |
| 3.5% of total base-year GHG emissions, excluding LULUCF | 3 764.745 kt CO ₂ eq (30 117.958 kt CO ₂ eq for the duration of the commitment period) |
| Cancellation of AAUs, CERs and ERUs and/or issuance of RMUs in the national registry for: | |
| 1. AR | Issue 955 043 RMUs |
| 2. Deforestation | Cancel 395 926 units |
| 3. FM | Issue 2 908 642 RMUs |

Note: Values in this table reflect the accounting quantities for activities under Article 3, para. 3, and FM and any elected activities under Article 3, para. 4, of the Kyoto Protocol as reported in table I.5.

Annex II

Information to be included in the compilation and accounting database

Tables II.1–II.8 include the information to be included in the compilation and accounting database for Greece. Data shown are from the Party's annual submission, including the latest revised estimates submitted, adjustments (if applicable) and the final data to be included in the compilation and accounting database.

Table II.1

Information to be included in the compilation and accounting database for 2020, including on the commitment period reserve, for Greece (t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| CPR | 432 712 049 | – | – | 432 712 049 |
| Annex A emissions | | | | |
| CO ₂ | 55 610 277 | – | – | 55 610 277 |
| CH ₄ | 9 685 198 | – | – | 9 685 198 |
| N ₂ O | 4 264 371 | 4 369 985 | – | 4 369 985 |
| HFCs | 5 122 680 | – | – | 5 122 680 |
| PFCs | 148 148 | – | – | 148 148 |
| Unspecified mix of HFCs and PFCs | NO, NA | – | – | NO, NA |
| SF ₆ | 4 939 | – | – | 4 939 |
| NF ₃ | NO, NA | – | – | NO, NA |
| Total Annex A sources^a | 74 835 613 | 74 941 227 | | 74 941 227 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –82 224 | – | – | –82 224 |
| Deforestation | 49 168 | – | – | 49 168 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –2 016 700 | – | – | –2 016 700 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.2

Information to be included in the compilation and accounting database for 2019 for Greece (t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|---|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 65 756 232 | – | – | 65 756 232 |
| CH ₄ | 9 991 411 | – | – | 9 991 411 |
| N ₂ O | 4 249 709 | 4 353 090 | – | 4 353 090 |
| HFCs | 5 464 565 | – | – | 5 464 565 |
| PFCs | 137 100 | – | – | 137 100 |
| Unspecified mix of HFCs and PFCs | NO, NA | – | – | NO, NA |
| SF ₆ | 4 921 | – | – | 4 921 |
| NF ₃ | NO, NA | – | – | NO, NA |
| Total Annex A sources^a | 85 603 938 | 85 707 320 | | 85 707 320 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –120 639 | – | – | –120 639 |
| Deforestation | 45 471 | – | – | 45 471 |

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | -1 999 202 | - | - | -1 999 202 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.3

Information to be included in the compilation and accounting database for 2018 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 71 781 990 | - | - | 71 781 990 |
| CH ₄ | 10 217 075 | - | - | 10 217 075 |
| N ₂ O | 4 260 640 | 4 361 148 | - | 4 361 148 |
| HFCs | 5 917 002 | - | - | 5 917 002 |
| PFCs | 135 313 | - | - | 135 313 |
| Unspecified mix of HFCs and PFCs | NO, NA | - | - | NO, NA |
| SF ₆ | 4 943 | - | - | 4 943 |
| NF ₃ | NO, NA | - | - | NO, NA |
| Total Annex A sources^a | 92 316 962 | 92 417 471 | | 92 417 471 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | -126 491 | - | - | -126 491 |
| Deforestation | 53 220 | - | - | 52 220 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | -2 071 565 | - | - | -2 071 565 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.4

Information to be included in the compilation and accounting database for 2017 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 74 845 050 | - | - | 74 845 050 |
| CH ₄ | 10 096 520 | - | - | 10 096 520 |
| N ₂ O | 4 343 591 | 4 460 596 | - | 4 460 596 |
| HFCs | 6 177 735 | - | - | 6 177 735 |
| PFCs | 125 794 | - | - | 125 794 |
| Unspecified mix of HFCs and PFCs | NO, NA | - | - | NO, NA |
| SF ₆ | 5 011 | - | - | 5 011 |
| NF ₃ | NO, NA | - | - | NO, NA |
| Total Annex A sources^a | 95 593 702 | 95 710 707 | | 95 710 707 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | -80 128 | - | - | -80 128 |
| Deforestation | 52 395 | - | - | 52 395 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | -1 972 710 | - | - | -1 972 710 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.5

Information to be included in the compilation and accounting database for 2016 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 71 364 164 | – | – | 71 364 164 |
| CH ₄ | 9 797 524 | – | – | 9 797 524 |
| N ₂ O | 4 284 936 | 4 385 856 | – | 4 385 856 |
| HFCs | 6 223 768 | – | – | 6 223 768 |
| PFCs | 135 168 | – | – | 135 168 |
| Unspecified mix of HFCs and PFCs | NO, NA | – | – | NO, NA |
| SF ₆ | 5 202 | – | – | 5 202 |
| NF ₃ | NO, NA | – | – | NO, NA |
| Total Annex A sources^a | 91 808 762 | 91 911 682 | | 91 911 682 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –138 411 | – | – | –138 411 |
| Deforestation | 56 166 | – | – | 56 166 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –1 922 383 | – | – | –1 922 383 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.6

Information to be included in the compilation and accounting database for 2015 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 74 927 631 | – | – | 74 927 631 |
| CH ₄ | 10 145 944 | – | – | 10 145 944 |
| N ₂ O | 4 226 870 | 4 331 100 | – | 4 331 100 |
| HFCs | 5 999 455 | – | – | 5 999 455 |
| PFCs | 119 522 | – | – | 119 522 |
| Unspecified mix of HFCs and PFCs | NO, NA | – | – | NO, NA |
| SF ₆ | 5 060 | – | – | 5 060 |
| NF ₃ | NO, NA | – | – | NO, NA |
| Total Annex A sources^a | 95 424 484 | 95 528 714 | | 95 528 714 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –124 406 | – | – | –124 406 |
| Deforestation | 44 896 | – | – | 44 896 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –1 953 555 | – | – | –1 953 555 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.7

Information to be included in the compilation and accounting database for 2014 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--------------------------|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 78 639 618 | – | – | 78 639 618 |
| CH ₄ | 10 340 349 | – | – | 10 340 349 |
| N ₂ O | 4 294 702 | 4 404 624 | – | 4 404 624 |
| HFCs | 5 842 566 | – | – | 5 842 566 |

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| PFCs | 134 634 | – | – | 134 634 |
| Unspecified mix of HFCs and PFCs | NA, NO | – | – | NA, NO |
| SF ₆ | 4 922 | – | – | 4 922 |
| NF ₃ | NA, NO | – | – | NA, NO |
| Total Annex A sources^a | 99 256 791 | 99 366 714 | | 99 366 714 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –146 890 | – | – | –146 890 |
| Deforestation | 47 277 | – | – | 47 277 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –1 964 656 | – | – | –1 964 656 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.8

Information to be included in the compilation and accounting database for 2013 for Greece(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 81 713 260 | – | – | 81 713 260 |
| CH ₄ | 10 533 540 | – | – | 10 533 540 |
| N ₂ O | 4 496 354 | 4 613 422 | – | 4 613 422 |
| HFCs | 5 740 514 | – | – | 5 740 514 |
| PFCs | 172 562 | – | – | 172 562 |
| Unspecified mix of HFCs and PFCs | NA, NO | – | – | NA, NO |
| SF ₆ | 5 151 | – | – | 5 151 |
| NF ₃ | NA, NO | – | – | NA, NO |
| Total Annex A sources^a | 102 661 381 | 102 778 450 | | 102 778 450 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –135 854 | – | – | –135 854 |
| Deforestation | 47 334 | – | – | 47 334 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –1 964 657 | – | – | –1 964 657 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which estimation methods are included in the 2006 IPCC Guidelines that were reported as “NE” or for which the ERT otherwise determined that there may be an issue with the completeness of the reporting in the Party’s inventory are the following:

- (a) 2.G.4 other (other product manufacture and use) (CO₂) (see ID# I.10 in table 3);
- (b) 4.B.1 cropland remaining cropland (CO₂) (see ID# L.10 in table 3).

Annex IV

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JH Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at <https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at <https://www.ipcc.ch/publication/good-practice-guidance-and-uncertainty-management-in-national-greenhouse-gas-inventories/>.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl>.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraiishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <https://www.ipcc.ch/publication/2013-revised-supplementary-methods-and-good-practice-guidance-arising-from-the-kyoto-protocol/>.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraiishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/>.

B. UNFCCC documents

Annual review reports

Reports on the individual reviews of the 2014, 2015, 2016, 2017, 2019 and 2021 annual submissions of Greece, contained in documents FCCC/ARR/2014/GRC, FCCC/ARR/2015/GRC, FCCC/ARR/2016/GRC, FCCC/ARR/2017/GRC, FCCC/ARR/2019/GRC and FCCC/ARR/2021/GRC respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <https://unfccc.int/documents/510888>.

Annual status report for Greece for 2022. Available at https://unfccc.int/sites/default/files/resource/asr2022_GRC.pdf.

C. Other documents used during the review

Responses to questions during the review were received from Dimitris Niavis (Ministry of Environment and Energy of Greece), including additional material on the methodology and assumptions used. The following references may not conform to UNFCCC editorial style as some have been reproduced as received:

A word file containing a detailed explanation of the Party's approach to deriving the HFC-227ea emissions per capita EF (2.F.3 - Fire Protection).