COMPLIANCE COMMITTEE **CC/ERT/ARR/2019/12**
24 April 2019

Report of the individual review of the annual submission of Romania submitted in 2018

Note by the secretariat

The report of the individual review of the annual submission of Romania submitted in 2018 was published on 17 April 2019. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2018/ROU, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

United Nations FCCC/ARR/2018/ROU

Framework Convention on Climate Change

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Report on the individual review of the annual submission of Romania submitted in 2018*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas inventory covering emissions and removals of greenhouse gas emissions 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 inventory review of the 2018 annual submission of Romania, 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 1 to 6 October 2018 in Bucharest, Romania.

* In the symbol for this document, 2018 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
ARR	annual review report
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
C	carbon
CaO	calcium oxide
CER	certified emission reduction
CH_4	methane
CHP	combined heat and power
CKD	cement kiln dust
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DE	digestible energy
DOM	dead organic matter
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
FM	forest management
FMRL	forest management reference level
$Frac_{LEACH-(H)}$	fraction of nitrogen input to managed soils that is lost through leaching and run-off
GE	gross energy
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood product
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPPU	industrial processes and product use
KP-LULUCF activities	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LULUCF	land use, land-use change and forestry
MgO	magnesium oxide
MMS	manure management systems
NA	not applicable
NCV	net calorific value

NE	not estimated
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NIR	national inventory report
NIS	National Institute of Statistics
NO	not occurring
NO_X	nitrogen oxides
N_2O	nitrous oxide
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
SWDS	solid waste disposal sites
UNFCCC	United Nations Framework Convention on Climate Change
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	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2018 annual submission of Romania 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" (decision 13/CP.20). The review took place from 1 to 6 October 2018 in Bucharest, Romania, and was coordinated by Ms. Lisa Hanle (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Romania.

Table 1
Composition of the expert review team that conducted the review of Romania

Area of expertise	*Name*	*Party*
Generalist	Mr. Ole-Kenneth Nielsen	Denmark
Energy	Mr. Tomoki Takahashi	Japan
IPPU	Mr. Mauro Meirelles de Oliveira Santos	Brazil
Agriculture	Ms. Yu'e Li	China
LULUCF	Ms. Yasna Rojas Ponce	Chile
Waste	Ms. Fatma Betül Demirok	Turkey
Lead reviewers	Mr. Nielsen	
	Mr. Santos	

2. The basis of the findings in this report is the assessment by the ERT of the Party's 2018 annual submission, in accordance with the Article 8 review guidelines. The ERT notes that the individual inventory review of Romania's 2017 annual submission did not take place in 2017 owing to insufficient funding for the review process.

3. The ERT has made recommendations that Romania resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, the encouragements of the ERT to Romania to resolve them, are also included.

4. A draft version of this report was communicated to the Government of Romania, which provided no comments.

5. Annex I shows annual GHG emissions for Romania, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Romania.

6. Information to be included in the compilation and accounting database can be found in annex II.

[1] At the time of publication of this report, Romania had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

II. Summary and general assessment of the 2018 annual submission

7. Table 2 provides the assessment by the ERT of the 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 inventory of Romania

Assessment			*Issue or problem ID#(s) in table 3 and/or 5*[a]
Dates of submission	Original submission: 13 April 2018 (NIR), 13 April 2018, version 1 (CRF tables), 13 April 2018 (SEF-CP1-2017 and SEF-CP2-2017 tables) Revised submissions: 7 May 2018 (NIR), 7 May 2018, version 3 (CRF tables), 19 November 2018, version 5 (CRF tables), 7 May 2018 (SEF-CP1-2017 and SEF-CP2-2017 tables) Unless otherwise specified, the values from the latest submission are used in this report		
Review format	In-country		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	Yes	G.14, L.3
	(b) Selection and use of methodologies and assumptions	Yes	I.16, I.17, L.6, L.13
	(c) Development and selection of EFs	Yes	I.12, A.13, L.5, L.14, L.16, L.18, L.19, L.20, L.22
	(d) Collection and selection of AD	Yes	E.33, A.12
	(e) Reporting of recalculations	No	
	(f) Reporting of a consistent time series	Yes	E.19, I.13
	(g) Reporting of uncertainties, including methodologies	Yes	G.7
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	G.1, A.5, L.1, L.8
	(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?	The Party did not report "NE" for any insignificant categories	
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	

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The 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	
	3. 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 technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported 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	
	5. 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 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	
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.1, KL.4, KL.7
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.10
	(c) Reporting requirements of decision 6/CMP.9	Yes	KL.9
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	Yes	KL.1
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	

Assessment			*Issue or problem ID#(s) in table 3 and/or 5*[a]
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Romania 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 the assessment of 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	
Question of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors and for KP-LULUCF activities that are not listed in this table but are included in table 3 and/or 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 issues and/or problems raised in the previous review report

8. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 21 June 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2018 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Romania

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Annual submission (G.1, 2016) (G.1, 2015) (table 3, 2014) Completeness	Estimate and report emissions from all mandatory categories.	Addressing. The recommendation relates to CH_4 emissions from silicon carbide production, which Romania reported in its 2018 annual submission, and N_2O emissions from manure management for rabbits, which the Party continues to report as "NO" (see ID# A.5 below).
G.2	NIR (G.2, 2016) (G.2, 2015) (table 3, 2014) Transparency	Improve the transparency and readability of the NIR by removing unnecessary repetition and outdated/redundant information (the remaining issues from the 2014 ARR are included in ID#s E.2, E.3,	Addressing. Transparency issues, originally identified in 2014, remain. See ID#s E.3, E.8, E.11, E.12 and I.1 below.

[4] FCCC/ARR/2016/ROU. The ERT notes that the individual inventory review of Romania's 2017 annual submission did not take place during 2017. As a result, the latest published ARR reflects the findings of the review of the Party's 2016 annual submission.

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
		E.8, E.11, E.12, E.13, E.16 and I.1 below).	
G.3	NIR (G.4, 2016) (G.4, 2015) Transparency	Review the NIR for redundant, repetitive and duplicative information and improve transparency related to the road transportation methodology and trends in the LULUCF sector (see ID# L.4 below) in the NIR.	Addressing. The ERT did not find any problems related to duplication of information regarding the methodology for road transportation. However, the issue included in ID# L.4 below has not yet been resolved.
G.4	Notation keys (G.8, 2016) (G.8, 2015) Transparency	Provide a full list of notation keys used and the reasons for using them in CRF table 9.	Resolved. CRF table 9 includes a list of the notation keys used ("NE" and "IE") and an explanation for their use.
G.5	National system (G.5, 2016) (G.5, 2015) Transparency	Make a clear distinction in the NIR between changes made to the national system since and prior to the previous annual submission.	Resolved. The NIR (chapter 13) includes a description of changes to the national system since and prior to the previous annual submission.
G.6	National registry (G.12, 2016) (G.12, 2015) Transparency	Designate a person as national registry administrator and publish his or her name and contact information on the national registry website, and include information on the representative identifier for all accounts in accordance with decision 13/CMP.1, annex, paragraph 45(d), and information on current holdings of ERUs, CERs, AAUs and RMUs in each account in accordance with decision 13/CMP.1, annex, paragraph 47(l), or clearly state that this information is confidential.	Resolved. The requested information on the registry administrator and publicly available information is included in the NIR (chapter 14) and on the registry website.
Energy			
E.1	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.1, 2016) (E.1, 2015) (22, 2014) (23, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Endeavour to facilitate effective access to, and the sharing of, relevant energy data between all relevant actors involved in data collection and processing.	Not resolved. No additional information has been provided in the NIR. During the review, Romania explained that it had initiated a cooperation protocol among the institutions involved in energy data collection and processing, and indicated that it would report on the improvements in its next annual submission.
E.2	Fuel combustion – reference approach – solid fuels – CO_2 (E.2, 2016) (E.2, 2015) (32, 2014) (34, 2013) Transparency	Provide, in the NIR, proof of the accuracy of the country-specific CO_2 EF for lignite, and an explanation for the reasons for the differences between the country-specific CO_2 EF for lignite, the IPCC default value and the values used by other reporting Parties.	Resolved. Romania clarified that emissions from operators reporting under the EU ETS are verified by accredited verifiers (NIR, p.101). The Party also explained the reasons for the differences in the country-specific CO_2 EF for lignite from the IPCC default value and values used by other Parties (NIR, p.174).

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
E.3	Fuel combustion – reference approach – solid fuels – CO_2 (E.3, 2016) (E.3, 2015) (32, 2014) Transparency	Explain the significant decrease in the CO_2 EF for lignite between 2007 and 2012.	Not resolved. During the review, Romania explained that the CO_2 EF for lignite decreases in the period 2007–2012 (from 103.44 t CO_2/TJ to 94.45 t CO_2/TJ) because of changes in the data reported by EU ETS operators, and changes in the number of operators reporting during this time period. The ERT reviewed the underlying data during the review and recognized the validity of this reason; however, the Party has not included this information in the NIR.
E.4	Fuel combustion – reference approach – solid fuels – CO_2 (E.4, 2016) (E.4, 2015) (33, 2014) Accuracy	Initiate a regular annual study to review the accuracy of the data from the EU ETS and its applicability to inventory purposes, and make any necessary changes to the process of determination of country-specific EFs and NCVs.	Resolved. During the review, Romania explained that it has initiated an annual review of the EU ETS data, which includes regular discussions between the National Environmental Protection Agency and NIS, including discussions related to the determination of country-specific EFs and NCVs.
E.5	Fuel combustion – reference approach – solid and other fossil fuels – CO_2 (E.14, 2016) (E.14, 2015) Transparency	Provide an explanation in the NIR for the CO_2 EFs for coke oven/gas coke and industrial waste being significantly lower than the IPCC default values, without disclosing confidential data.	Not resolved. During the review, Romania provided background data for the calculation of the country-specific CO_2 EFs and explained that the reasons for their being lower than the IPCC default values relate to data reported by EU ETS operators. Although the ERT recognizes that the calculation methodology is reasonable, the Party did not provide these reasons for the lower CO_2 EFs for coke oven/gas coke and industrial waste in the NIR.
E.6	Feedstocks, reductants and other non-energy use of fuels – liquid and gaseous fuels – CO_2 (E.15, 2016) (E.15, 2015) Transparency	Harmonize the data on “carbon stored” in CRF table 1.A(b) and “carbon excluded” in CRF table 1.A(d) for bitumen, natural gas and paraffin wax for the entire time series.	Resolved. The values reported in CRF tables table 1.A(b) and 1.A(d) for bitumen, natural gas and paraffin wax were the same for the entire time series.
E.7	International bunkers and multilateral operations – liquid fuels – CO_2, CH_4 and N_2O (E.5, 2016) (E.5, 2015) (26, 2014) (29, 2013) (57, 2012) Transparency	Harmonize the values reported in CRF tables 1.C and 1.A(b) for jet kerosene.	Not resolved. The values for jet kerosene reported in CRF tables 1.D (formerly CRF table 1.C) and 1.A(b) for 1989 and 2015 are still inconsistent. For example, for 2015, the reported values are 9,625.36 and 10,018.24 TJ in CRF tables 1.D and 1.A(b), respectively.
E.8	1.A. Fuel combustion – sectoral approach – liquid and solid fuels – CO_2 (E.6, 2016) (E.6, 2015) (29, 2014) Transparency	Provide information on the applicability of the EU ETS EF data for the years 1989–2006 and for fuel consumption for installations not covered under the EU ETS for the entire time series.	Not resolved. There is no further information on the applicability of the EU ETS CO_2 EF data for the years 1989–2006 or on installations not covered under the EU ETS for the entire time series included in the NIR. During the review, Romania explained that CO_2 EFs are not technology-dependent and are therefore applicable to installations not covered under the

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
			EU ETS, and that the fuel characteristics do not change over the years.
E.9	1.A. Fuel combustion – sectoral approach – liquid and solid fuels – CO_2 (E.7, 2016) (E.7, 2015) (29, 2014) Transparency	Examine whether the use of EU ETS average emission data for all years, instead of only for the period 2007–2010, would improve the accuracy of the estimates for the period 1989–2006, and report on the outcome in the NIR.	Addressing. During the review, Romania explained that the CO_2 EFs for the period 1989–2006 were determined by a study conducted in 2011, and this is why data only up to the year 2010 are used to determine these CO_2 EFs. The Party also explained that to recalculate the EFs using data from 2007 to the latest year on an annual basis would be prohibitively resource-intensive. Although the ERT agrees with these explanations, this information was not provided in the NIR (see ID# E.28 in table 5).
E.10	1.A. Fuel combustion – sectoral approach – liquid and solid fuels – CO_2 (E.16, 2016) (E.16, 2015) Transparency	Explain in the NIR under which conditions the values of the EFs, including the oxidation factor, are higher than the values of the EFs excluding the oxidation factor.	Not resolved. Information additional to that in the previous annual submission is not included in the NIR. During the review, Romania explained that both of the EFs excluding and including the oxidation factor were calculated on the basis of AD, NCVs and EFs reported by EU ETS operators. The ERT considers that it is still unclear what makes the values of the EFs including the oxidation factor higher than those of the EFs excluding the oxidation factor (see ID# E.27 in table 5).
E.11	1.A.1.a Public electricity and heat production – liquid fuels – CO_2 (E.8, 2016) (E.8, 2015) (30, 2014) (35, 2013) Transparency	Report in the NIR the fuel mix information for the category public electricity and heat production where the IEF varies notably over the years owing to the variation in the fuel mix.	Not resolved. Romania did not report fuel mix information for public electricity and heat production. During the review, the Party provided a table showing fuel mix information, including the CO_2 EF for each fuel, and indicated that it would include the table in the next annual submission.
E.12	1.A.1.c Manufacture of solid fuels and other energy industries – solid fuels – CO_2 (E.9, 2016) (E.9, 2015), (34, 2014) Transparency	Report in the NIR the fuel mix information for the category manufacture of solid fuels and other energy industries where the IEF varies notably over the years due to a variation in the fuel mix.	Not resolved. Romania did not report the fuel mix information for the category manufacture of solid fuels and other energy industries. During the review, the Party provided a table showing fuel mix information, including the CO_2 EF for each fuel, and indicated that it would include the table in the next annual submission.
E.13	1.A.3.b Road transportation – liquid fuels – CO_2 (E.12, 2016) (E.12, 2015) (37, 2014) (36, 2013) Transparency	Justify the applicability of the EU ETS CO_2 EF for diesel used in road transportation or estimate the emissions by using data on CO_2 EFs from fuel producers and/or fuel importers and NCVs from either fuel producers and/or importers, or from the energy balance.	Resolved. The Party no longer uses the EU ETS CO_2 EF for diesel used in road transportation. During the review, Romania explained that it currently uses default CO_2 EFs from the *EMEP/EEA Air Pollutant Emission Inventory Guidebook* for the period 1989–2004 and the COPERT model for the period 2005–2016.
E.14	1.A.3.b Road transportation – liquid and gaseous fuels – N_2O (E.17, 2016) (E.17,	Check the time-series consistency of the emission estimates for N_2O emissions from liquid and gaseous fuels, and report the correct emission estimates in both the CRF tables and the NIR.	Resolved. Romania updated the data in the CRF tables and information in the NIR (p.219) to ensure time-series consistency of the estimates for the N_2O emissions from liquid and gaseous fuels.

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
	2016) Consistency		
E.15	1.A.3.b Road transportation – liquid and gaseous fuels – N_2O (E.18, 2016) (E.18, 2016) Consistency	Investigate how the data on the number of vehicles up to 2004 (provided by NIS) are obtained (e.g. via a complete survey, as an estimate using a sample survey or using a model) with a view to ensuring a consistent time series for the number of vehicles.	Resolved. During the review, Romania explained that it investigated the collection of data on the number of vehicles for the period 1989–2004 and reported a consistent time series for the number of vehicles used in the estimates. The ERT considered the explanation reasonable but noted that information on how the consistency of the time series is ensured has not been included in the NIR (see ID# E.32 in table 5).
E.16	1.A.4.b Residential – – solid fuels – CO_2 (E.13, 2016) (E.13, 2015) (35, 2014) Transparency	Report in the NIR the fuel mix information for the category residential where the IEF varies notably over the years due to a variation in the fuel mix.	Not resolved. Romania did not report fuel mix information for residential. During the review, the Party provided a table showing fuel mix information, including the CO_2 EF for each fuel, and indicated that it would include the table in the next annual submission.
E.17	1.B.1.a Coal mining and handling – solid fuels – CH_4 (E.19, 2016) (E.19, 2015) Transparency	Include information on AD and assumptions to estimate CH_4 emissions from abandoned underground mines in the NIR.	Resolved. Romania included information on AD and assumptions to estimate CH_4 emissions from abandoned underground mines in the NIR (p.266).
E.18	1.B.1.a Coal mining and handling – solid fuels – CH_4 (E.20, 2016) (E.20, 2015) Transparency	Improve the transparency of the information provided on how the AD for coal mining for surface mines are derived.	Resolved. Romania explained which data sources and assumptions were used to obtain the AD for coal mining for surface mines in the NIR (p.264).
E.19	1.B.1.a Coal mining and handling – solid fuels – CH_4 (E.21, 2016) (E.21, 2015) Consistency	Confirm the validity of the ratio used to derive the surface mine production data to ensure time-series consistency, and, if appropriate, revise the time series subject to the outcome of this assessment.	Addressing. Romania has performed an analysis on the validity of the ratio used to derive the surface mine production data with the result that the values available at the national level and those used in the inventory accurately reflect mining in Romania. The Party therefore continued to use the national values. However, during the review, on the basis of its discussions with the ERT, Romania agreed to revise the ratio used to derive the surface mine production data for the period 1989–1999 (see ID# E.33 in table 5).
E.20	1.B.2 Oil, natural gas and other emissions from energy production – liquid fuels –CO_2, CH_4 and N_2O (E.22, 2016) (E.22, 2015) Transparency	Include additional information on density values for each fuel, including explanations for the use of the density values for crude oil and liquefied natural gas as proxies for bitumen and natural gas liquids, in the NIR.	Resolved. During the review, Romania explained that it had excluded bitumen from AD in this category because it had determined that bitumen is not used as an input to the refinery process. The Party also explained that it had obtained and used specific density values of natural gas liquids; these are provided in the NIR (p.277).
E.21	1.B.2.a Oil – liquid fuels – CO_2 and CH_4 (E.23, 2016) (E.23,	Provide information in the NIR explaining why the current choice of AD for subcategory 1.B.2.a.2 is	Resolved. Romania had included fuel oil and bitumen production in the AD for subcategory 1.B.2.a.2 in the previous annual submission,

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
	2015) Transparency	appropriate to the national circumstances.	which had resulted in a discrepancy of the AD between subcategories 1.B.2.a.1 and 1.B.2.a.2. The ERT noted that the AD of the two subcategories match in the current annual submission. During the review, the Party clarified that, following an analysis it had conducted, it had decided not to include fuel oil and bitumen production in the AD for subcategory 1.B.2.a.2. The ERT concluded that the explanation of the AD used for this subcategory provided in the NIR (pp.278 and 279) is appropriate.
E.22	1.B.2.a Oil – liquid fuels – CO_2 and CH_4 (E.24, 2016) (E.24, 2015) Transparency	Clearly describe the source of the EFs for catalyst coke in section 3.3.2.2.1 of the NIR, and conduct any necessary corrections to the values of the EFs.	Resolved. Romania corrected the values of the EFs for catalyst coke, and described the source of the EFs in the relevant section of the NIR (p.281).
E.23	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.25, 2016) (E.25, 2015) Completeness	Justify whether fugitive emissions from gas storage occur or report the emissions under subcategory 1.B.2.b.iii.4 (other – transmission and storage).	Resolved. Romania reported the fugitive emissions from gas storage under the subcategory 1.B.2.b.iii.4 and included an explanation for doing so in the NIR (pp.284 and 285).
E.24	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.26, 2016) (E.26, 2015) Transparency	Describe the recalculation for gas production and gas processing in the NIR.	Resolved. Romania estimated and included in its inventory fugitive emissions from gas processing, which had been recalculated on the basis of the discussions during the inventory review in 2016, and described the methodology in the NIR (pp.283 and 284). The ERT noted that there was no recalculation for fugitive emissions from gas production.
E.25	1.B.2.c Venting and flaring – gaseous fuels – CO_2 and CH_4 (E.27, 2016) (E.27, 2015) Transparency	Correctly report the CO_2 EF for subcategory 1.B.2.c.ii (venting – gas) in the NIR.	Resolved. Romania corrected the value of the CO_2 EF for subcategory 1.B.2.c.ii in the NIR (p.289).
E.26	1.B.2.d Other (oil, natural gas and other emissions from energy production) – gaseous fuels – CH_4 (E.28, 2016) (E.28, 2015) Comparability	Report the sum of "leakage at industrial plants and power stations" and "leakage in residential and commercial sectors" under subcategory 1.B.2.b.iii.6 (natural gas – other (other leakage)) for the AD and emissions.	Resolved. Romania reported the sum of "leakage at industrial plants and power stations" and "leakage in residential and commercial sectors" under subcategory 1.B.2.b.iii.6 for the AD and emissions.
IPPU			
I.1	2. General (IPPU) (I.2, 2016) (I.2, 2015) (40, 2014) Transparency	Remove the outdated information in the NIR.	Addressing. Although improvements were made to update the references in the metals category to the 2006 IPCC Guidelines, references to the IPCC good practice guidance remain in the NIR (e.g. for nitric acid production and fluorinated gases).

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
I.2	2.A.4 Other process uses of carbonates – CO_2 (I.7, 2016) (I.7, 2015) Transparency	Describe the recalculation of CO_2 emission estimates from category 2.A.4 (other process uses of carbonates) in the NIR.	Resolved. Recalculations for this category are described in the NIR (p.332).
I.3	2.B Chemical industry – CO_2 (I.8, 2016) (I.8, 2015) Transparency	Report CO_2 emissions from silicon carbide production (category 2.B.5.a) and titanium dioxide production (category 2.B.6) in the appropriate category or report them using the notation key "IE", and include information on the allocation of CO_2 emissions from silicon carbide production (category 2.B.5.a) and titanium dioxide production (category 2.B.6) in the NIR.	Resolved. Emissions from silicon carbide and titanium dioxide production were reported as "IE" and referred to in CRF table 9. Relevant information on the allocation of CO_2 emissions from these categories is included in the NIR (pp.347 and 350).
I.4	2.B.1 Ammonia production – CO_2 (I.9, 2016) (I.9, 2015) Accuracy	Review the CO_2 emissions from ammonia production by considering imports, exports and production of urea.	Resolved. CO_2 emissions from ammonia production take into account urea production, imports and exports. The CO_2 flux of both urea production used in agriculture and urea exported was discounted.
I.5	2.B.1 Ammonia production – CO_2 (I.10, 2016) (I.10, 2015) Comparability	Report all emissions from natural gas in ammonia production under the IPPU sector.	Resolved. All emissions from natural gas used for ammonia production were accounted for in the IPPU sector in the annual submission.
I.6	2.B.2 Nitric acid production – N_2O (I.11, 2016) (I.11, 2015) Transparency	Include information on the efficiency of the abatement systems for N_2O emissions in the NIR.	Resolved. Information on the efficiency of abatement systems is included in the NIR (p.344).
I.7	2.B.5 Carbide production – CO_2 and CH_4 (I.12, 2016) (I.12, 2015) Transparency	Use the correct notation key, "NO", to report silicon carbide production emissions for the years 1989–2002.	Resolved. The correct notation key, "NO", was used for both CO_2 and CH_4 emissions from silicon carbide production for the period 1989–2002 in CRF table 2(I).A-Hs1.
I.8	2.B.5 Carbide production – CO_2 (I.13, 2016) (I.13, 2015) Transparency	Use the production of calcium carbide as the AD in both the CRF tables and the NIR.	Resolved. Romania reported that the AD for calcium carbide production include calcium carbide production and use in the NIR (p.348) and CRF table 2(I).A-Hs1.
I.9	2.G.3 N_2O from product uses – N_2O (I.6, 2016) (I.6, 2015) (47, 2014) Completeness	Consider the newly available data for estimating emissions from solvent and other product use.	Resolved. N_2O emissions from propellant in aerosol products used in the food industry (whipped cream) were reported for the entire time series based on data provided by one of two of the largest importers.
I.10	2.G.3 N_2O from product uses – N_2O (I.14, 2016) (I.14, 2015) Completeness	Continue efforts to identify a source of data to allow for the estimation of emissions for this category.	Resolved. N_2O emissions from propellant in aerosol products used in the food industry (whipped cream) were reported for the entire time series based on data provided by one of two of the largest importers.

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
Agriculture			
A.1	3. General (agriculture) – CH_4 and N_2O (A.13, 2016) (A.13, 2015) Transparency	Accurately report the contribution of CH_4 and N_2O emissions from the agriculture sector as well as the contribution of the agriculture sector to the national total GHG emissions in the NIR.	Addressing. Although the values for the contribution of CH_4 and N_2O emissions from the agriculture sector as well as the contribution of the agriculture sector to the national total GHG emissions in table 5.2 of the NIR are correct, Romania reported in the accompanying text that the contribution of CH_4 and N_2O emissions to the total GHG emissions of the agriculture sector were 69.76 per cent and 31.32 per cent, respectively (NIR, p.469). The sum of these emissions is greater than 100 per cent.
A.2	3.A.1 Cattle – CH_4 (A.6, 2016) (A.6, 2015) (54, 2014) (54, 2013) Accuracy	Avoid the use of a constant value for milk production.	Resolved. Romania reported that the GE intake of dairy cattle was calculated using equation 10.16 of the 2006 IPCC Guidelines, in which net energy for lactation was included. The reported milk production ranged from 3.16 to 9.88 kg/day and the calculated GE from 205.58 to 267.22 MJ/head/day between 1989 and 2016.
A.3	3.A.1 Cattle – CH_4 (A.7, 2016) (A.7, 2015) (54, 2014) (54, 2013) Accuracy	Estimate milk production per animal per day using the milk production data provided by NIS and the number of dairy cattle.	Resolved. Romania reported milk production per day for cows and buffalo. The data source is NIS.
A.4	3.B Manure management – N_2O (A.14, 2016) (A.14, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correctly report the weighted average of Nex rate for each livestock subcategory in the CRF tables.	Not resolved. The Nex rate in column C of CRF table 3.B(b) is presented not as a weighted average but as an arithmetic mean of the average Nex rates of all subcategories.
A.5	3.B Manure management – N_2O (A.15, 2016) (A.15, 2015) Completeness	Provide for rabbits, turkeys and ducks either N_2O emission estimates or justification for their exclusion, along with all required documentation.	Addressing. N_2O emissions from MMS of ducks and turkeys were estimated under the subcategory poultry. N_2O emissions from rabbits were not included in the 2018 annual submission. The ERT calculated that the underestimation was less than 0.05 per cent of national total GHG emissions.
A.6	3.B Manure management – N_2O (A.16, 2016) (A.16, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correctly report the MMS for each livestock subcategory in CRF table 3.B(a) and the NIR.	Not resolved. The inconsistencies identified during the previous review still exist. During the review, the Party indicated that it will implement this recommendation in the next annual submission.
A.7	3.B.4 Other livestock – N_2O (A.17, 2016) (A.17, 2015) Adherence to the UNFCCC Annex I	Correct the error in CRF table 3.B(a) (i.e. clarify that 60 per cent of manure from buffalo is deposited on pasture, range and paddock).	Not resolved. Romania continues to use 6 per cent of manure from buffalo deposited on pasture, range and paddock in CRF table 3.B(a)s2. During the review, Romania confirmed that the value should be 60 per cent.

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
	inventory reporting guidelines		
A.8	3.B.5 Indirect N_2O emissions – N_2O (A.18, 2016) (A.18, 2015) Completeness	Provide either justification for use of the notation key "NO" or estimate indirect N_2O emissions owing to nitrogen leaching and run-off from MMS.	Resolved. Romania reported indirect N_2O emissions resulting from nitrogen leaching and run-off from MMS.
A.9	3.D.a.4 Crop residues – N_2O (A.19, 2016) (A.19, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report the correct fraction of $Frac_{LEACH-[H]}$ in CRF table 3.D and report in the NIR enhanced information regarding the calculation of the ratio of above-ground residue dry matter to harvested yield for all crops.	Addressing. Romania transparently reported information regarding the calculation of the ratio of above-ground residue dry matter to harvested yield for all crops in the NIR (pp.545–550). However, the Party continued to report "NO" for $Frac_{LEACH-[H]}$ in the additional information of CRF table 3.D. Romania also did not correctly report the ratio of above-ground residue dry matter to harvested yield for all crops in the additional information of CRF table 3.D.
A.10	3.F Field burning of agricultural residues – CH_4 and N_2O (A.20, 2016) (A.20, 2015) Comparability	Correct the reporting of the IEFs in CRF table 3.F so that the IEFs reflect the actual inventory method used for estimating CH_4 and N_2O emissions from field burning of crop residues.	Resolved. Romania corrected the CO_2 and CH_4 IEFs for field burning of agricultural residues in CRF table 3.F. These values are comparable with IPCC defaults in the 2006 IPCC Guidelines (volume 4, table 2.5).
A.11	3.H Urea application – CO_2 (A.21, 2016) (A.21, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report the correct amounts of CO_2 emissions from urea application by revising the formula used for the calculation of emissions.	Addressing. Romania corrected the AD for urea application reported in the NIR (p.562). However, the AD reported in CRF table 3.G-I reflected the amount of nitrogen and not urea, resulting in a CO_2 EF (0.43 t CO_2-C/t) that is not consistent with the IPCC default value (0.2 t CO_2-C/t). Romania reported the correct CO_2 emissions in CRF table 3.G-1 (60.71 kt CO_2 in 2016).
LULUCF			
L.1	4. General (LULUCF) (L.4, 2016) (L.4, 2015) (64, 2014) Completeness	(a) Report DOM in wetlands converted to cropland; living biomass and DOM in settlements converted to cropland; DOM in cropland converted to grassland; and DOM in wetlands converted to grassland using the notation key "NE" instead of "NO";	(a) Resolved. Romania changed the notation key for reporting DOM in wetlands converted to cropland, settlements converted to cropland, and cropland converted to grassland from "NO" to "NE";
		(b) Report living biomass and mineral soil pools in wetlands converted to grassland using the notation key "NE" instead of "NO", and explain in CRF table 9 the reason for using the notation key "NE";	(b) Not resolved. Romania did not change the notation key for reporting living biomass and mineral soil pools in wetlands converted to grassland;
		(c) Explain in CRF table 9 the reason for using the notation key "NE" for DOM in wetlands converted to cropland; living biomass and DOM in settlements	(c) Not resolved. Romania did not provide an explanation for the use of the notation key "NE" in CRF table 9. During the review, the

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
		converted to cropland; DOM in cropland converted to grassland; and all pools in wetlands converted to grassland.	Party informed the ERT that it would include this information in the next annual submission.
L.2	4. General (LULUCF) (L.12, 2016) (L.12, 2015) Transparency	Improve the description and transparency of the land-use definitions reported in the NIR (section 6.2). Romania presented information in the NIR on the classification of forests according to tree species. The information was not transparent and potential double counting was identified, arising from an interpretation of the land-use definitions provided in section 6.2 of the NIR.	Not resolved. Romania did not improve the land-use definitions and the information in the NIR on the classification of forests according to tree species. During the review, the Party indicated that it would include this information in the next annual submission.
L.3	4. General (LULUCF) (L.13, 2016) (L.13, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure the consistency of the key categories between the LULUCF sector and KP-LULUCF activities. The ERT noted that land converted to settlements and land converted to other land were identified as key categories, but Romania did not document why deforestation associated with these conversions was not considered a key category.	Not resolved. Romania estimated emissions from deforestation as 7,748.46 kt CO_2 of net emissions, which is a higher value than that for some of the key categories (e.g. land converted to wetlands and land converted to settlements). The Party did not document in the NIR why deforestation is not considered a key category.
L.4	Land representation – CO_2, CH_4 and N_2O (L.15, 2016) (L.15, 2015) Transparency	Improve the transparency and consistency of the land-use matrices between the NIR (tables 6.5 and 6.7) and the CRF tables independently of the implementation of the new methodology.	Not resolved. Romania did not update the information on land-use matrices in the NIR (in table 6.5 of and annex 6.7 to the 2018 annual submission) so as to be consistent with information in the CRF tables. During the review, the Party indicated that it would improve this information in the next annual submission.
L.5	4.A Forest land – CO_2 (L.16, 2016) (L.16, 2015) Accuracy	Analyse the effect of not using species-specific carbon fractions for the estimates of emissions and removals with a view to ensuring that the estimates are accurate.	Not resolved. The Party continued to use a carbon fraction that is applicable to all trees rather than species-specific fractions. No further information was provided in the NIR. During the review, Romania indicated it is considering this recommendation further and that it would be implemented in the next annual submission.
L.6	4.A.1 Forest land remaining forest land – CO_2 (L.5, 2016) (L.5, 2015) (66, 2014) (61, 2013) (119, 2012) Accuracy	Provide estimates for the DOM and mineral soil pools using the tier 2 methodology.	Not resolved. During the review, Romania informed the ERT that is making efforts to provide estimates for the DOM and mineral soil pools using the tier 2 methodology in the next annual submission.
L.7	4.A.1 Forest land remaining forest land – CO_2 (L.17, 2016) (L.17, 2015) Transparency	Transparently present the root/shoot ratio used, consistent with the 2006 IPCC Guidelines, with regard to key categories and tier methods.	Addressing. Romania reported information about the R factor (root/shoot ratio) in table 6.7 of the NIR; however, information on selection of the root/shoot ratio is not included in the NIR. During the review, the Party indicated that

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
			it would include an explanation for the origin of the root/shoot ratio in the next NIR.
L.8	4.C.1 Grassland remaining grassland – CO_2 (L.9, 2016) (L.9, 2015) (68, 2014) (65, 2013) (126, 2012) Completeness	Estimate and report the carbon stock changes from mineral soils.	Not resolved. Romania reported "NE" for the estimation of carbon stock changes in mineral soils. During the review, the Party indicated that an improvement plan related to the development of a national system to respond to accounting requirements set out in EU decision 529/2013/EU exists.
L.9	4.C.1 Grassland remaining grassland – CO_2 (L.9, 2016) (L.9, 2015) (68, 2014) (65, 2013) (126, 2012) Completeness	Estimate and report the carbon stock changes from organic soils.	Resolved. Romania used a tier 1 approach and default EFs from table 6.3 of volume 4, chapter 6 of the 2006 IPCC Guidelines to estimate the carbon stock changes from organic soils for grassland remaining grassland and reported emissions in CRF table 4.C for the entire time series.
L.10	4.C.1 Grassland remaining grassland – CO_2 (L.10, 2016) (L.10, 2015) (68, 2014) (65, 2013) (126, 2012) Transparency	Use the notation key "NE" instead of "NO" for pools for which the tier 1 methodology is used, assuming no change in carbon stock.	Resolved. Romania used the notation key "NE" to report pools for which the tier 1 methodology was used (i.e. DOM in grassland remaining grassland).
L.11	4.G HWPs – CO_2 (L.18, 2016) (L.18, 2015) Transparency	Ensure the consistency and accuracy of the reported harvested volume values between the NIR and the CRF tables.	Resolved. The harvested volume values are accurate and consistent between the NIR and the CRF tables.
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.1, 2016) (W.1, 2015) (74, 2014) (69 and 72, 2013) Accuracy	Make efforts to develop country-specific CH_4 EFs and parameters for the estimation of emissions from this category.	Resolved. Romania developed country-specific degradable organic carbon values for each year of the time series. Although other country-specific EFs and parameters have not been developed yet, the ERT concluded that the IPCC first-order decay tier 2 method can be used with some default parameters, as described in the 2006 IPCC Guidelines (volume 5, figure 3.1).
KP-LULUCF			
KL.1	General (KP-LULUCF) – CO_2 (KL.1, 2016) (KL.1, 2015) Transparency	Improve the transparency and consistency of how emissions associated with salvage logging are accounted for with regard to the natural disturbance provision between the NIR and the CRF tables.	Not resolved. Romania did not update the information on the estimated portion of salvage harvest of the standing volume. During the review, Romania indicated that it is considering this recommendation and that the improvements will be included in the next annual submission.
KL.2	General (KP-LULUCF) – CO_2, CH_4 and N_2O (KL.2, 2016) (KL.2, 2015) Transparency	Improve the transparency and consistency of the reported data on wildfires and windfalls as natural disturbances in the NIR.	Not resolved. Romania did not update the information on the time series of the excluded natural disturbances, and did not change the values for the baseline or margin. During the review, Romania indicated that it is considering this recommendation and that the improvements will be included in the next annual submission.

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
KL.3	General (KP-LULUCF) – CO_2, CH_4 and N_2O (KL.5, 2016) (KL.5, 2015) Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	Correct the hierarchy of KP-LULUCF activities.	Not resolved. Romania reported RV as higher in the hierarchy than FM. The ERT noted that the correct order is deforestation, AR, FM and elected Article 3, paragraph 4, activities. During the review, Romania indicated that it is considering this recommendation and that the improvements will be included in the next annual submission.
KL.4	FM – CO_2 (KL.4, 2016) (KL.4, 2015) Transparency	Include the justification for the assumption that DOM is not a net source in the NIR.	Not resolved. Romania did not include in the NIR evidence supporting the assumption that DOM is not a net source. During the review, Romania indicated that it is further considering this recommendation.
KL.5	RV – CO_2, CH_4 and N_2O (KL.6, 2016) (KL.6, 2015) Completeness	Estimate and report CO_2, CH_4 and N_2O emission estimates for RV for the base year.	Resolved. Romania estimated and reported CO_2, CH_4 and N_2O emissions for RV for the base year.
KL.6	HWPs – CO_2 (KL.7, 2016) (KL.7, 2015) Transparency	Improve the transparency of the description of the half-lives for wood panels and sawnwood, including the justification for the expert judgment used, in the NIR.	Resolved. According to the NIR (p.622) Romania used information on the half-lives of products from the Kyoto Protocol Supplement (table 2.8.2). Expert judgment is no longer used.
KL.7	HWPs – CO_2 (KL.8, 2016) (KL.8, 2015) Transparency	Improve the transparency of reporting of the required information (i.e. how emissions and removals from the HWP pool have been accounted for, following the requirements set out in annex II to decision 2/CMP.8 and decision 2/CMP.7).	Not resolved. Romania did not make any changes to the section of the NIR concerning how emissions and removals from the HWP pool have been accounted for.

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

[b] The review of the 2017 annual submission of Romania did not take place during 2017 and, as such, the 2017 annual review report was not available at the time of this review. Therefore, the recommendations reflected in table 3 are taken from the 2016 annual review report. For the same reason, the year 2017 is excluded from the list of years in which the issue has been identified.

IV. Issues identified in three 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 included in table 4 have been identified in three successive reviews, including the review of the 2018 annual submission of Romania, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Romania

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
General		
G.1	Estimate and report emissions from all mandatory categories	3 (2014–2018)
G.2	Improve the transparency and readability of the NIR by removing unnecessary repetition and outdated/redundant information	3 (2014–2018)
Energy		
E.1	Endeavour to facilitate effective access to, and the sharing of, relevant energy data between all relevant actors involved in data collection and processing	4 (2013–2018)
E.3	Explain the significant decrease in the CO_2 EF for lignite between 2007 and 2012	3 (2014–2018)
E.7	Harmonize the values reported in CRF tables 1.C and 1.A(b) for jet kerosene	5 (2012–2018)
E.8	Provide information on the applicability of the EU ETS EF data for the years 1989–2006 and for fuel consumption for installations not covered under the EU ETS for the entire time series	3 (2014–2018)
E.9	Examine whether the use of EU ETS average emission data for all years, instead of only for the period 2007–2010, would improve the accuracy of the estimates for the period 1989–2006, and report on the outcome in the NIR	3 (2014–2018)
E.11	Report in the NIR the fuel mix information for the category public electricity and heat production where the IEF varies notably over the years owing to the variation in the fuel mix	4 (2013–2018)
E.12	Report in the NIR the fuel mix information for the category manufacture of solid fuels and other energy industries where the IEF varies notably over the years due to a variation in the fuel mix	3 (2014–2018)
E.16	Report in the NIR the fuel mix information for the category residential where the IEF varies notably over the years due to a variation in the fuel mix	3 (2014–2018)
IPPU		
I.1	Remove the outdated information in the NIR	3 (2014–2018)
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		
L.1	Report living biomass and mineral soil pools in wetlands converted to grassland using the notation key “NE” instead of “NO”, and explain in CRF table 9 the reason for using the notation key “NE”	3 (2014–2018)
	Explain in CRF table 9 the reason for using the notation key “NE” for DOM in wetlands converted to cropland; living biomass and DOM in settlements converted to cropland;	

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
	DOM in cropland converted to grassland; and all pools in wetlands converted to grassland	
L.6	Provide estimates for the DOM and mineral soil pools using the tier 2 methodology	5 (2012–2018)
L.8	Estimate and report the carbon stock changes from mineral soils	5 (2012–2018)
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

[a] The review of the 2017 annual submission of Romania did not take place during 2017. Therefore, the year 2017 is not taken into account when counting the number of successive years in table 4. In addition, as the reviews of the 2015 and 2016 annual submissions were held in conjunction with each other, they are not considered "successive" years and 2015/2016 is considered as one year.

V. Additional findings made during the individual review of the 2018 annual submission

10. Table 5 contains findings made by the ERT during the individual review of the 2018 annual submission of Romania that are additional to those identified in table 3.

Table 5
Additional findings made during the individual review of the 2018 annual submission of Romania

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.7	Uncertainty analysis	In the NIR (section 1.6), Romania described the process for estimating uncertainties and presented the results for the latest year and the uncertainty for the trend. The ERT noted, however, that the uncertainty for the base year had not been reported even though this is a mandatory requirement (para. 15 of the UNFCCC Annex I inventory reporting guidelines). During the review, Romania provided an uncertainty estimate for the base year. Furthermore, the ERT noted that Romania has based its uncertainty analysis on a report following a workshop in 2012; however, as improvements have been made to the inventory, the uncertainty of the estimates could be affected. The ERT recommends that Romania report an uncertainty estimate for the base year. The ERT also recommends that the Party periodically reassess the uncertainty analysis so that the uncertainties reflect improvements made to the accuracy of the inventory.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.8	Uncertainty analysis	Romania estimated uncertainties using approach 1 of the 2006 IPCC Guidelines. During the review, the ERT inquired about the Party's plans to implement an uncertainty analysis using approach 2 (which is encouraged in para. 15 of the UNFCCC Annex I inventory reporting guidelines). Romania informed the ERT that it is planning to carry out an uncertainty analysis using approach 2 in the future. The ERT encourages Romania to implement its plan to carry out an approach 2 uncertainty estimation in a future annual submission.	Not an issue/problem
G.9	QA/QC and verification	In the NIR, Romania reported information on QA activities, which include international reviews of the Romanian GHG inventory, bilateral cooperation on inventory activities and activities related to national inventory improvement studies. The ERT noted that the majority of activities were carried out several years ago and most QA activities are conducted at an international level. During the review, Romania provided more information on QA activities carried out in recent years, including national activities for the IPPU and LULUCF sectors. The ERT considers that much benefit could be derived from expanding on the national QA activities by involving experts from academia and other research institutions or industry. The ERT encourages Romania to continue expanding on its national QA activities by involving experts from academia and other research institutions or industry.	Not an issue/problem
G.10	Key category analysis	Romania estimated key categories using approach 1 of the 2006 IPCC Guidelines. During the review, the ERT inquired about the Party's plans to implement a key category analysis using approach 2 (which is encouraged in para. 14 of the UNFCCC Annex I inventory reporting guidelines). Romania informed the ERT that it is planning to carry out a key category analysis using approach 2 in the future.	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		The ERT encourages Romania to continue planning to carry out an approach 2 key category analysis in a future annual submission.	
G.11	QA/QC and verification	The ERT detected numerous errors in Romania's annual submission, both straightforward transcription errors in the CRF tables and errors in the emission estimations. Errors were identified in several sectors (see ID#s I.12, I.13, A.12, A.13, A.16, L.13, L.14, L.16, L.18, L.19, L.20, L.22, W.3 and KL.10 below). During the review, upon the request of the ERT, Romania provided sector-specific QC checklists. While the checklists include checks for the entire inventory preparation process, the number of errors identified by the ERT suggest that further strengthening of the QC system is needed. Specific recommendations to address the errors identified during the review are included in the respective issue ID#s. The ERT recommends that Romania strengthen the QC system for its inventory preparation by analysing the errors identified by the ERT during the review to assess whether additional checks should be added to the current checklists or the current checks should be reformulated and report on the changes made in the NIR.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.12	Further improvements (identified by the Party)	Table 10.4 of the NIR lists some planned improvements; however, neither a status of implementation for the planned improvements nor a timeline for their completion is included in the table. During the review, Romania provided the ERT with an updated table showing the status of implementation of the planned improvements and a deadline for their implementation. The ERT noted that some of the planned improvements listed in table 10.4 of the NIR had already been implemented in the 2018 annual submission. The ERT recommends that Romania improve the transparency of its reporting by listing the planned improvements separately from the improvements already carried out, and by including the status of implementation and expected date for inclusion of the planned improvements in the NIR, as provided to the ERT during the review.	Yes. Transparency
G.13	CRF tables	CRF table 6 includes indirect N_2O emissions from the agriculture sector only (indirect CO_2 emissions from the agriculture sector are reported as "NO"). For the other sectors, indirect CO_2 and N_2O emissions are reported as "NO" or "NE", or left blank. During the review, Romania indicated that it would improve the reporting of these emissions in the next annual submission. The ERT, noting that Romania reports emissions of the precursors for indirect CO_2 and partly for indirect N_2O emissions and could therefore include an estimate of at least indirect CO_2 emissions in the inventory, encourages the Party to estimate and report indirect CO_2, and to the extent possible indirect N_2O, emissions.	Not an issue/problem
G.14	Key category analysis	According to the 2006 IPCC Guidelines (volume 1, section 4.2), for certain categories comprised of subcategories, where a category is identified as key, the inventory compiler should determine which subcategories are significant. This information is not included in Romania's NIR. The following categories identified as key have not been subdivided: 1.B.2.a, 1.B.2.b, 2.A.4, 3.A, 3.B, 3.D.1, 3.D.2, 4.A.1, 4.A.2, 4.B.1, 4.B.2, 4.C.1, 4.C.2, 4.D.2, 4.E.2, 5.A and 5.D. It is not clear from the NIR whether this lack of subdivision means that all subcategories of these categories are considered as key categories in the inventory. This has an impact on the assessment of whether the	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		methodological choice has been made in accordance with the 2006 IPCC Guidelines. During the review, Romania provided the ERT with an assessment of which subcategories of the identified key categories are significant. The ERT recommends that Romania provide a key category analysis following the guidance in the 2006 IPCC Guidelines, that is, by providing information on which subcategories of the following key categories are significant: 1.B.2.a, 1.B.2.b, 2.A.4, 3.A, 3.B, 3.D.1, 3.D.2, 4.A.1, 4.A.2, 4.B.1, 4.B.2, 4.C.1, 4.C.2, 4.D.2, 4.E.2, 5.A and 5.D.	
G.15	Methods	Romania reported the methodological tiers with a high degree of aggregation in CRF table Summary 3, but did not include in the information on the more detailed level on which the key category analysis is carried out. It is therefore not possible for the ERT to determine whether individual key categories have been estimated using higher-tier methods. During the review, Romania provided the ERT with a more detailed overview of the methodological tier used for the key categories. The ERT recommends that Romania report in its NIR the methodological tier used for each key category (at the most detailed level of the key category analysis) by, for example, adding a table in the NIR or an annex listing the key categories and the tier for each, or including the tiers in the introduction to each sectoral chapter.	Yes. Transparency
G.16	NIR	During the review, the ERT identified a lack of transparency in many parts of the NIR covering several sectors, specifically: (1) background data used in the energy sector (e.g. EU ETS data and vehicle statistics) (see ID#s E.28 and E.32 below); (2) data on coal mining (see ID#s E.34 and E.35 below); (3) data on CKD (see ID# I.11 below); (4) information on methodologies, equations and assumptions used for the agriculture sector (see ID#s A.14, A.15, A.17 and A.18 below); (5) the description of specific land uses and parameters (see ID#s L.15, L.17, and L.21 below); and (6) data and methodologies for landfilling, composting and wastewater handling (see ID#s W.2, W.3, W.5 and W.7 below). Transparency issues identified during previous reviews related to the CO_2 EFs of lignite and coke oven/gas coke (see ID#s E.3 and E.5 in table 3), bunker fuels (see ID# E.7 in table 3), EU ETS data (see ID# E.8 in table 3), oxidation factors (see ID# E.10 in table 3), the fuel mix in various categories (see ID#s E.11, E.12 and E.16 in table 3), references to previous versions of IPCC guidelines (see ID# I.1 in table 3), land-use definitions (see ID# L.2 in table 3), land-use matrices (see ID# L.4 in table 3), salvage logging (see ID KL.1 in table 3), natural disturbances (see ID# KL.2 in table 3), HWPs (see ID# KL.7 in table 3) and the justification that DOM is not a source (see ID# KL.4 in table 3). The ERT noted the importance of Romania improving the transparency of the NIR by implementing the improvements elaborated in the recommendations related to transparency in table 3 above and in this table.	Not an issue/problem
Energy			
E.27	Fuel combustion – reference approach – solid and liquid fuels – CO_2	Tables 3.5 and 3.6 of the NIR list the two types of EFs used for fuel combustion, that is, EFs including or excluding the oxidation factor. Romania used EFs including the oxidation factor for the sectoral approach, and EFs excluding the oxidation factor and the default oxidation factor (equal to one) for the reference approach. During the review, Romania explained that it used EFs including the oxidation factor for the sectoral approach to estimate actual emissions from each emission category taking into account its technology level, while using EFs excluding the	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		oxidation factor for the reference approach so as to estimate potential emissions in a comprehensive manner. The ERT noted that this difference in the oxidation factor of EFs might increase the discrepancy between the two approaches. The ERT recommends that Romania ensure the consistency and comparability of the EFs between the two approaches.	
E.28	1.A. Fuel combustion – sectoral approach – solid, liquid and gaseous fuels – CO_2	The NIR (chapter 3.2.4.2) presents, in a transparent manner, the approach Romania has taken to obtain estimates of country-specific CO_2 EFs, NCVs and oxidation factors as weighted averages from the data in the verified reports of installations covered under the EU ETS. EU ETS data for every year between 2007 and 2016 were used to calculate the emissions in the corresponding year, while for the period 1989–2006, the average weighted values for the period 2007–2010 were used. However, the NIR does not include transparent information regarding the applicability of the average weighted data from the period 2007–2010 to the period 1989–2006. During the review, Romania explained that the EFs for the period 1989–2006 were determined by a study conducted in 2011 (see ID# E.9 in table 3 above). While acknowledging that this explanation is reasonable, the ERT considers that the applicability of the CO_2 EFs should be examined on a regular basis to ensure the accuracy of CO_2 emission estimates from 1989 to 2006. The ERT encourages Romania to examine the applicability of the average weighted data from the period 2007–2010 to the period 1989–2006 on a regular basis (e.g. every three years) by, for example, comparing and analysing the trend of the CO_2 EFs between the period 2007–2010 and all years from 2007 onward.	Not an issue/problem
E.29	Feedstocks, reductants and other non-energy use of fuels – solid fuels – CO_2	The ERT noted some differences between the "carbon stored" data in CRF table 1.A(b) and the "carbon excluded" data in CRF table 1.A(d) for coking coal from 1989 to 2016, other bituminous coal from 1991 to 1997, and coal tar from 1989 to 2016. During the review, Romania indicated that it would revise the data in the two tables to harmonize them in the next annual submission. The ERT recommends that Romania harmonize the data on "carbon stored" in CRF table 1.A(b) and "carbon excluded" in CRF table 1.A(d) for coking coal, other bituminous coal and coal tar for the entire time series.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
E.30	1.A.1.a Public electricity and heat production – solid, liquid and gaseous fuels – CO_2, CH_4 and N_2O	In annex 4.3 to the NIR, the energy balance table of solid fuels shows that blast furnace gas is consumed in main activity producer CHP plants in Romania; however, the ERT noted that the Party did not explain the methodologies used to estimate these emissions or indicate in which category they are reported. During the review, Romania clarified that these emissions were estimated using the default EFs in the 2006 IPCC Guidelines and the consumption data reported in the energy balance table, and that they are reported under the category 1.A.1.a (public electricity and heat production). The ERT recommends that Romania include information in its NIR clarifying that CO_2, CH_4 and N_2O emissions from blast furnace gas consumed in main activity producer CHP plants are estimated using the default EFs in the 2006 IPCC Guidelines and the consumption data reported in the energy balance table, and that these emissions are reported under the category 1.A.1.a (public electricity and heat production).	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
E.31	1.A.2.g Other (manufacturing industries and construction) – solid, liquid and gaseous fuels – CO_2, CH_4 and N_2O	Category 1.A.2.g (other (manufacturing industries and construction)) is the largest source of emissions under category 1.A.2 (manufacturing industries and construction) from 1989 to 2016. The ERT noted that Romania did not report a breakdown of emission data for category 1.A.2.g by industry, even though the energy balance tables in annex 4 to the NIR have energy consumption data for the construction industry and the textile and leather industry. The ERT encourages Romania to estimate and report disaggregated emissions for the construction industry and the textile and leather industry under category 1.A.2.g (other (manufacturing industries and construction)) using the data reported in the energy balance tables.	Not an issue/problem
E.32	1.A.3.b Road transportation – liquid and gaseous fuels – N_2O	The NIR (section 3.2.7.3.2) includes the information that data on the number of vehicles were obtained from NIS until 2004 and from the Romanian Automotive Register since 2005. The previous ERT had made a recommendation that Romania investigate how data on the number of vehicles up to 2004 had been obtained with a view to ensuring a consistent time series for the number of vehicles (see ID# E.15 in table 3). During the review, Romania explained that data for the period 1989–2004 were primarily collected by the Ministry of Internal Affairs (Directorate for Driving Licenses and Vehicles Registration) on the basis of data and information in existing vehicle registration documents submitted to NIS, who compiled a database on the type of use of vehicles that was then processed by the Romanian Automotive Register. The Party also explained that the Register, given its expertise with road vehicles and previous research data, considered that the data fully reflected the national circumstances in the sense that the data captured all available information and data. While considering this explanation reasonable, the ERT noted that this information is not included in the NIR. The ERT recommends that Romania explain in the NIR that the data on the number of vehicles up to 2004 obtained from NIS are processed by the Romanian Automotive Register, given its expertise with road vehicles and previous research data, and all available information and data is used to ensure time-series consistency of the data between the data sets, and particularly between 2004 and 2005.	Yes. Transparency
E.33	1.B.1.a Coal mining and handling – solid fuels – CH_4	According to the NIR (p.264), the AD for surface mines for the period 1989–1999 are assumed to amount to 85 per cent of total lignite production for that period. The percentage was obtained from a study conducted by NIS and the Institute for Studies and Power Engineering, and was based on expert judgment. For 2000 onward, the AD were obtained directly from the data reported to Eurostat. According to the NIR (section 3.3.1.2.1), 74 per cent of total lignite production was from surface mines in 2000. Although the ratio of surface mines to underground mines decreased by more than 10 per cent between 1999 and 2000, Romania did not explain the reason for this decline in a transparent manner in the NIR. During the review, Romania provided the background data for calculations conducted in the study of NIS and the Institute for Studies and Power Engineering. The ERT noted that the study used average data for the ratio of surface and underground mine lignite production from 2000 to 2010 to determine the ratio for the period 1989–1999 (85 per cent). The ERT also noted that the ratio of surface mine to underground mine lignite production consistently increased from 2000 (74 per cent) to 2010 (97 per cent). The Party explained that this increasing trend was due to the closure of several underground coal mines, which started in the late 1990s. On the basis of this information, the ERT considers that it is more appropriate for Romania to apply the ratio from	Yes. Accuracy

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		2000 (74 per cent) than the average ratio of the period 2000–2010 to calculate surface and underground mine production of lignite for the period 1989–1999. The ERT recommends that Romania calculate and report fugitive emissions from coal mines in the period 1989–1999 using the ratio of lignite production from surface mines to underground mines in 2000 (74 per cent). The ERT also recommends that the Party describe in the NIR the changes in methodologies, sources of information and assumptions used for estimating these emissions.	
E.34	1.B.1.a Coal mining and handling – solid fuels – CH_4	In the 2018 annual submission, Romania reported CH_4 emissions from underground coal mining for 2016 as not occurring. This was the first time during the time series in which underground coal mining had not occurred. CH_4 emissions from underground mining over the reported time series ranged from 194.69 kt CH_4 in 1989 to 1.02 kt CH_4 in 2015 for underground mining and from 27.23 kt CH_4 in 1989 to 0.22 kt CH_4 in 2015 for underground post-mining. During the review, as part of its follow-up to previous recommendations and new questions raised by the ERT, Romania provided the ERT with new information obtained from NIS showing updated coal production data from 2007 to 2016. According to this new information, coal production in 2016 was 1,031.611 kt. The ERT noted that the exclusion of this coal production from the reporting constitutes an underestimation of emissions from both mining and post-mining activities in excess of 0.05 per cent of the national total GHG emissions. Therefore, in accordance with decision 22/CMP.1 in conjunction with decision 4/CMP.11, annex, paragraph 73, the ERT included this issue in the list of potential problems and further questions raised by the ERT. The ERT recommended that Romania estimate CH_4 emissions from underground coal mining (both active mining and post-mining emissions) using the latest available AD provided by NIS and the default EFs from the 2006 IPCC Guidelines (volume 2, section 4.1.3.2), which have been used to estimate emissions for active and post-mining emissions for other mining operations. In response to the list of potential problems and further questions raised by the ERT, Romania submitted revised estimates for CH_4 emissions from underground coal mining (active mining and post-mining emissions) for the period 2007–2016 using the latest available AD provided by NIS and the default EFs from the 2006 IPCC Guidelines. The revised estimates increased CH_4 emissions from mining in 2016 by 11.93 kt CH_4 and from post-mining by 1.73 kt CH_4. The ERT agreed with the revised estimates.	Not an issue/problem
E.35	1.B.1.a Coal mining and handling – solid fuels – CH_4	Romania used the tier 1 methodology to estimate CH_4 emissions from abandoned underground mines even though it identifies category 1.B.1.a (coal mining and handling) as a key category with no subdivisions. The decision tree in the 2006 IPCC Guidelines indicates that in this case, emissions should be estimated using the tier 2 approach (volume 2, section 4.1.5.1). On the basis of discussions with the Party during the review week, the ERT noted that data are available to support a tier 2 estimation. In addition, Romania identified during the review week new information with additional data on the number of coal mines closed from 1935 onward. The ERT also noted that the use of the tier 1 approach constitutes an underestimation of emissions from abandoned coal mines in excess of 0.05 per cent of the national total GHG emissions. Therefore, in accordance with decision 22/CMP.1 in conjunction with decision 4/CMP.11, annex, paragraph 73, the ERT included this issue in the list of potential problems and further questions raised by the ERT. The ERT	Yes. Transparency

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		recommended that Romania implement a tier 2 calculation in line with the guidance in the 2006 IPCC Guidelines (volume 2, section 4.1.5.2) to estimate CH_4 emissions from abandoned underground coal mines using the newly obtained data on the number of abandoned coal mines. In response to the list of potential problems and further questions raised by the ERT, Romania submitted revised estimates for the full time series for CH_4 emissions from abandoned underground coal mines, implementing a tier 2 calculation in line with the guidance in the 2006 IPCC Guidelines and using the newly obtained data on the number of abandoned coal mines. The revised estimate for 2016 (208.58 kt CH_4) was 192.34 kt CH_4 higher than the estimate in the original annual submission. The ERT agreed with the revised estimate. The ERT recommends that Romania update in the NIR the methodological description of the estimation of CH_4 emissions from abandoned underground coal mines to reflect the use of a tier 2 methodology and the updated AD.	
IPPU			
I.11	2.A.1 Cement production – CO_2	The ERT noted that the information on the CKD correction factor is not sufficiently clear in the NIR. The CO_2 EFs for cement production are derived from the average values of the plant-specific content of CaO and magnesium oxide in the clinker for the years 2008 to 2016 (NIR, p.309). However, when using these values in NIR equation 4.1, the ERT could not derive the same values as those shown in NIR table 4.4 for CO_2 emissions from clinker production in the period 1989–2016. The ERT noted that the values in table 4.4 also do not match the CO_2 IEF values reported in CRF table 2(I).A-Hs1 (e.g. NIR table 4.4 reports 0.5304 t CO_2/t and the CRF table reports 0.5362 t CO_2/t in 2016). After Romania reviewed the calculations for this category during the review, the ERT found that table 4.4 does not include the correction for CKD, calculated separately, which explains why the values do not match those in the CRF table. Moreover, the ERT was informed by the Party that two of the seven cement plants did not report CKD corrections in 2016, as required by the tier 2 approach. During the review, after consultation with the cement plant operators, Romania informed the ERT that the five plants that included CKD corrections in their questionnaires had in fact included emissions from calcinated bypass dust in their estimates. All five operators completely recycle CKD, and two of them do not have calcinated bypass dust. The ERT recommends that Romania revise NIR table 4.4 to include the correction due to emissions from calcinated bypass dust such that the resulting CO_2 IEF in NIR table 4.4 matches the CO_2 IEF reported in CRF table 2(I).A-Hs1 for each year, and provide an explanation in the NIR regarding the additional CO_2 emissions owing to CKD. In addition, the ERT encourages the Party to modify the questionnaire that is sent annually to cement plant operators such that it includes a specific question on bypass dust.	Yes. Transparency
I.12	2.A.2 Lime production – CO_2	In NIR table 4.6 the explanation noted for the first column, which lists EFs for “EU ETS lime producers”, is that the EFs are for those lime production plants that sell to the market and are covered under the EU ETS. The ERT noted that these EFs (ranging from 0.864 to 0.914 t CO_2/t CaO) are higher than the stoichiometric EF for pure CaO and higher than those listed in the second column of table 4.6 which lists EFs for “EU–ETS captive lime productions and non-ETS lime production units” (in both cases, 0.785 t CO_2/t CaO). During the review, Romania indicated that the EFs come directly from the EU ETS. The default EFs are higher because the EU ETS plants in column 1 report	Yes. Accuracy

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		emissions from energy and industrial processes together. As the combustion-related CO_2 emissions are already accounted for under the energy sector, the ERT concluded that emissions from lime production are overestimated because of double counting. The ERT recommends that Romania use the same stoichiometric EF for lime production plants operating under the EU ETS as that used for the EU ETS captive lime and calcium lime production operations not under the EU ETS to avoid double counting of emissions.	
I.13	2.A.2 Lime production – CO_2	Romania has two sources of data for lime production: (1) total calcium lime data from 1989 to 2016, which are NIS data; and (2) quicklime (considered in Romania to be calcium lime with about 3 per cent water content) data from 2009 to 2016, which come from a questionnaire filled in by plant operators. To align data for the period 1989–2008 (with and without water), a correction factor was used. During the review, Romania shared with the ERT the calculations used to correct data for the period 1989–2008, and the ERT concluded that the correction factor was weighted on the wrong data series. The average correction factor, calculated for the period 2009–2012, was weighted using the operator questionnaire series, not the NIS series, which is the information standing since 1989, resulting in a correction factor of 75.16 per cent instead of 74.91 per cent and a small underestimation of CO_2 emissions for the period 1989–2008. The ERT recommends that Romania improve the accuracy of the time series of data for lime production by using the NIS total calcium lime data from 2009 to 2012 to derive the weighted average for the correction factor used to account for the water content of lime for the years 1989 to 2008.	Yes. Accuracy
I.14	2.A.2 Lime production – CO_2	The NIR (p.312) includes a list of data elements that Romania requests of lime production plant operators through a questionnaire. The list includes "Stoichiometric ratio (t CO_2/t CaO for lime or t CO_2/t CaO MgO for dolomite lime)". During the review, Romania clarified that it uses the term "stoichiometric" for the IEF, giving operators the opportunity to provide this value in the questionnaire. The ERT noted that this could result in confusion among operators as the stoichiometric value is different from an EF and should be strictly used for the chemical relationship between CO_2 and CaO. The ERT recommends that Romania improve the transparency of its reporting by using the term "stoichiometric" in the NIR only for chemical relationships among substances, such as for the conversion of calcium carbonate to CaO and CO_2, not for IEFs. In addition, the ERT encourages the Party to amend its operator questionnaire accordingly to avoid any misunderstanding related to this term.	Yes. Transparency
I.15	2.B.1 Ammonia production – CO_2	Romania followed the recommendation made in the previous review report to improve the calculations for ammonia production (category 2.B.1) by considering the CO_2 flux involved in urea imports, exports and production in addition to its use as a fertilizer (see ID# I.4 in table 3) and by considering the use of natural gas for energy combustion under the IPPU sector (see ID# I.5 in table 3). In the 2018 annual submission, Romania made recalculations for ammonia production and included the use of natural gas for energy under the IPPU sector. Regarding urea, the Party discounted the CO_2 emissions from urea used in agriculture and the CO_2 emissions related	Yes. Comparability

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		to the production of urea that is exported. During the review, Romania indicated that it is analysing the use of urea in automotive catalytic converters, although there are currently insufficient data for an estimate. As a result, the CO_2 IEF for ammonia production in the 2018 annual submission (2.01 t/t for 2015) is less than the CO_2 IEF in the 2017 annual submission (2.07 t/t for 2015). The ERT acknowledges these recalculations; however, it noted that Romania did not report these CO_2 fluxes (for urea used in agriculture or exported) as recovery in CRF table 2(I).A-Hs1 (recovery is reported as "NO"), leading to a misrepresentation of the CO_2 IEF. The ERT recommends that Romania report recovery in CRF table 2(I).A-Hs1 for the discounted amounts of CO_2, including CO_2 used in agriculture, exported, and, if appropriate, the CO_2 recovered for use in automotive catalytic converters. In addition, the ERT encourages the Party to investigate the uses of urea in the country beyond those included in the 2006 IPCC Guidelines that could result in CO_2 emissions, and report any such emissions, as appropriate.	
I.16	2.D.1 Lubricant use – CO_2	Regarding emissions from lubricant use, Romania reported that all lubricants are used in the IPPU sector, and that it applied an oxidation during use factor of 1 (NIR, p.392). The 2006 IPCC Guidelines have a default factor of 0.2 for lubricant use, excluding that used in two-stroke engines. The ERT recommends that Romania use an oxidation during use factor of 0.2 for the emissions related to lubricant use in the IPPU sector, in accordance with the 2006 IPCC Guidelines, and report the quantity of lubricant used in two-stroke engines – for which an oxidation during use factor of 1 applies – under the energy sector.	Yes. Accuracy
I.17	2.F.1 Refrigeration and air conditioning – HFCs	Romania did not clearly describe in the NIR (section 4.7.2) the methodology and assumptions used for the estimation of emissions under category 2.F.1 (refrigeration and air conditioning). The ERT noted that many references to the IPCC good practice guidance remain in the NIR, including the definitions for the approaches used (i.e. top-down tier 2 and bottom-up tier 2). The methodologies in the 2006 IPCC Guidelines for subapplications of refrigeration and air conditioning are named tier 2a (EF approach) and tier 2b (mass-balance approach). For two of the subapplications reported by Romania – commercial refrigeration and industrial refrigeration – the NIR indicates that the top-down tier 2 approach was used, which should be translated into tier 2b (mass-balance approach) (the corresponding method in the 2006 IPCC Guidelines). The Party calculated these emissions using the annual sales minus the total charge of new equipment plus the original total charge of retiring equipment minus intentional destruction. During the review, Romania provided a spreadsheet for commercial refrigeration. The ERT noted that the model used includes emissions from operation of equipment (which should not be included in a top-down model and results in an overestimation of emissions) and also takes into account the remaining charge of retiring equipment (which also should not be included in a top-down model and decreases emissions, although not significantly as there is little retiring equipment at this time). For the other subapplications (domestic and transport refrigeration, and mobile and stationary air conditioning), the NIR indicates that the bottom-up tier 2 approach was used, which should be translated into tier 2a (EF approach) (the corresponding method in the 2006 IPCC Guidelines). Romania provided the spreadsheet for domestic refrigeration as an example of these subcategories. The ERT noted that one of the terms	Yes. Accuracy

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		from equation 7.1 of the 2006 IPCC Guidelines, namely the emissions from the management of containers, is not accounted for. This term is defined by equation 7.11 as the percentage of the HFC market for new equipment and servicing of all refrigeration applications. The ERT also noted that the lack of this term could lead to an underestimation of emissions from containers for these subcategories. Moreover, the model is not used consistently regarding the evolution of the number of items of equipment, that is, beginning with one year, the next year should be the result of additions from production and imports and deductions from exports. As a general assessment, it is not possible to affirm that emissions were underestimated or overestimated. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions. The ERT recommends that Romania follow the methodologies for estimating emissions from refrigeration and air conditioning in the 2006 IPCC Guidelines and update its models accordingly, ensuring that all emissions are included.	
Agriculture			
A.12	3. General (agriculture) – CH_4 and N_2O	Romania reported the livestock population for each subcategory in annex 3.5 to the NIR. The ERT noted, for 2016, that the population of cattle under one year of age does not equal the population of calves for slaughter plus other cattle, and the total population of swine, sheep and goats does not equal the sum of each of these subcategories. During the review, Romania acknowledged these errors. The Party clarified that the populations of non-dairy cattle, sheep and goats used for the emission calculations were correct, but that it had reported a lower swine population and a higher poultry population for 2016. The differences between the reported and actual values for 2016 for the populations of swine and poultry are 220.1 and 243.1 thousand head, respectively. The ERT informally recalculated CH_4 emissions from enteric fermentation, and CH_4 and N_2O emissions from MMS using the correct swine and poultry populations. The ERT determined that Romania, in its reporting, had underestimated CH_4 emissions from enteric fermentation (by 0.30 kt CH_4), and CH_4 and N_2O emissions from MMS due to incorrect population numbers (by 1.74 kt CH_4 and 0.01 kt N_2O). The total underestimation was 54.13 kt CO_2 eq (or 0.048 per cent of the national total GHG emissions without LULUCF) for swine and poultry in 2016, meaning the underestimation for any one subcategory is below the threshold for inclusion of these underestimates as potential problems. The ERT recommends that Romania correctly estimate the livestock population for swine and poultry for 2016, recalculate emissions and incorporate a specific QC check to ensure the accuracy of the reported figures.	Yes. Accuracy
A.13	3. General (agriculture) – CH_4	The ERT was not able to repeat the calculation to determine DE (per cent) for the subcategories “ewes of milk and fitted” and “pigs under 20 kg” on the basis of the information provided in the NIR (pp.483 and 484). During the review, the ERT calculated the DE (per cent) for “ewes of milk and fitted” and “pigs under 20 kg” to be 46.05 and 81.91 per cent, respectively, rather than 44.57 and 82.88 per cent, respectively, as reported in the NIR. The ERT also recalculated CH_4 emissions from MMS for “ewes of milk and fitted” and “pigs under 20 kg” and using the calculated DE (per cent) values. The CH_4 emissions from MMS of “ewes of milk and fitted” were found to be overestimated by 0.12 kt and those for pigs under 20 kg underestimated by 0.11 kt. The CH_4 emissions from MMS	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		were 0.01 kt lower than the estimates in the 2018 annual submission. Romania acknowledged the errors in DE (per cent) calculations and confirmed that the recalculated results of the ERT were correct. The ERT recommends that Romania correct the DE (per cent) calculation for the entire time series for CH_4 emissions from enteric fermentation and MMS of swine and sheep. The ERT further recommends that Romania correctly report the DE (per cent) for the subcategories "ewes of milk and fitted" and "pigs under 20 kg" in the NIR and incorporate a specific QC to check to ensure the accuracy of the reported figures.	
A.14	3. General (agriculture) – CH_4 and N_2O	In the NIR (p.482), Romania reported that the GE intake for dairy cattle was calculated using equation 10.16 of the 2006 IPCC Guidelines. However, the Party did not report the equations and relevant values of the parameters used for the calculation of net energy required by the animal for maintenance, net energy for animal activity, net energy for growth and GE intake. During the review, Romania provided a worksheet for the dairy cattle GE intake calculation and relevant information on the parameters. The ERT recommends that Romania include the equations and values of the parameters used to estimate net energy required by the animal for maintenance, net energy for animal activity, net energy for growth and GE intake for dairy cattle in the NIR.	Yes. Transparency
A.15	3. General (agriculture) – CH_4	In the NIR (p.482), Romania reported that the body weight of dairy cattle is 550 kg. The ERT noted that this is the same figure as that in the 2017 annual submission, but that 650 kg had been reported in earlier annual submissions. There was no explanation and no reference provided in the NIR for this recalculation. The lower body weight of dairy cattle could result in an underestimation of CH_4 emissions from enteric fermentation and manure management. During the review, the ERT recalculated CH_4 emissions from enteric fermentation and manure management for dairy cattle using the previously reported body weight of 650 kg. The CH_4 emissions from enteric fermentation using body weights of 550 and 650 kg were 136.84 and 148.80 kt, respectively, in 2016. The CH_4 emissions from manure management using body weights of 550 and 650 kg were 7.44 and 8.09 kt, respectively, in 2016. The differences in the informal recalculations by the ERT from the 2018 annual submission in CH_4 emissions from enteric fermentation and manure management for dairy cattle in 2016 were 11.96 kt (or 0.27 per cent) and 0.65 kt (or 0.01 per cent) of national total emissions without LULUCF. Therefore, in accordance with decision 22/CMP.1, annex, paragraph 73, the ERT included this issue in the list of potential problems and further questions raised by the ERT. The ERT recommended that Romania either use a body weight of 650 kg for dairy cattle or justify using a body weight of 550 kg. In response to the list of potential problems, Romania submitted revised estimates of the CH_4 emissions from enteric fermentation and manure management for dairy cattle using a body weight of 650 kg for the full time series (1989–2016). The ERT agreed with the revised estimates, which were consistent with the revised estimates it had calculated during the review. The ERT recommends that Romania update in the NIR the description of the methodology used for the estimation of CH_4 emissions from dairy cattle enteric fermentation and manure management to reflect the revised body weight of 650 kg.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
A.16	3.B Manure management – CH_4 and N_2O	The ERT calculated the average allocations of MMS for non-dairy cattle and swine on the basis of the population, allocation of MMS and volatile solids of non-dairy cattle and swine subcategories provided in annex 3.5 to the NIR. The ERT noted that the results of its calculations were not consistent with the values provided in CRF table 3.B(a)s2. For instance, for non-dairy cattle, the ERT-calculated allocation of liquid slurry, solid storage, and pasture, range and paddock was 1.1, 52.1 and 46.7 per cent, respectively, rather than 0.88, 53.0 and 46.13 per cent, as reported in CRF table 3.B(a)s2. For swine, the ERT-calculated allocation of anaerobic lagoons, solid storage, and other (pit storage) was 43.9, 18.4 and 37.7 per cent, respectively, while the corresponding allocation in CRF table 3.B(a)s2 was 34.8, 17 and 48.2 per cent, respectively. During the review, Romania explained that the allocations of MMS presented in CRF table 3.B(a)s2 were the arithmetic averages of subcategories rather than a weighted average of MMS for each livestock subcategory. The Party also explained that it calculated CH_4 emissions from MMS for each of the subcategories and then aggregated the emissions. Therefore, the incorrect allocation of MMS in CRF table 3.B(a)s2 did not result in an inaccurate CH_4 emission estimation. The ERT recommends that Romania improve the transparency of its reporting by including in the NIR the weighted average allocation of MMS in CRF table 3.B(a)s2.	Yes. Transparency
A.17	3.C Rice cultivation – CH_4	Romania reported that the tier 1 methodology was applied to estimate CH_4 emissions from rice cultivation. The ERT noted that the CH_4 EF for rice cultivation was significantly lower than that recommended in the 2006 IPCC Guidelines. The CH_4 emissions from rice cultivation were estimated to be 0.00048 kt CH_4 in 2016 in CRF table 3.C. During the review, the ERT determined that Romania seemed to have misunderstood the cultivation period. The ERT informally recalculated CH_4 emissions from rice cultivation on the basis of the planting area, rice growing period (determined to be 120 days) and an EF provided by the Party during the review week. Romania confirmed the ERT's recalculation. The difference between the estimate calculated by the ERT and the original estimate was 0.056 per cent of the national total GHG emissions without LULUCF in 2016. In accordance with decision 22/CMP.1, annex, paragraph 73, the ERT included this issue in the list of potential problems and further questions raised by the ERT. The ERT recommended that Romania correct the estimation of CH_4 emissions from rice cultivation using the correct cultivation period (determined to be 120 days during the review week). In response to the list of potential problems, Romania submitted revised estimates of CH_4 emissions from rice cultivation using a cultivation period of 120 days and a revised EF (the CH_4 IEF increased from 0.005 to 26.820 g/m^2 in 2016) for the entire time series (1989–2016). These changes resulted in an increase in CH_4 emissions for 2016 of 63.02 kt CO_2 eq. The ERT agreed with the revised estimates. The ERT recommends that Romania improve the transparency of its reporting by including in its NIR the method for determining the CH_4 EF and justifying the use of a 120-day cultivation period for estimating CH_4 emissions from rice cultivation.	Yes. Transparency
A.18	3.D.a Direct N_2O emissions from	During the review, the ERT noted that Romania, in estimating the annual amount of synthetic nitrogen fertilizer applied to soils, had subtracted the amount of nitrogen volatilized as ammonia and NO_X from the calculation. This is not in line with the 2006 IPCC Guidelines, which state that for the tier 1 approach, the amounts of mineral nitrogen	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
	managed soils – N_2O	fertilizers and organic nitrogen fertilizers are no longer adjusted for the amounts of ammonia and NO_X volatilized after application to soil, which is a change from the methodology described in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (2006 IPCC Guidelines, volume 4, p.11.12). The ERT noted that the subtraction of nitrogen volatilized from the calculation of synthetic nitrogen fertilizer applied to soils constitutes an underestimation of emissions from inorganic nitrogen fertilizers applied to soils. During the review, the ERT calculated direct N_2O emissions from managed soils due to the application of mineral fertilizers consistently with the 2006 IPCC Guidelines. The difference between the reported value compared to the value calculated by the ERT during the review was found to be 0.54 kt N_2O, which is 0.142 per cent of national total emissions without LULUCF in 2016. Romania acknowledged this matter and confirmed the ERT's calculation. In accordance with decision 22/CMP.1, annex, paragraph 73, the ERT included this issue in the list of potential problems and further questions raised by the ERT. The ERT recommended that Romania revise the estimate of N_2O emissions from inorganic nitrogen fertilizers by not subtracting the amount of nitrogen that volatilizes as ammonia and NO_X. In response to the list of potential problems, Romania submitted revised AD of inorganic nitrogen fertilizers and estimates of N_2O emissions from them by not subtracting the amount of nitrogen that volatilizes as ammonia and NO_X after application to soil for the entire time series (1989–2016). The ERT agreed with the revised AD and the revised estimates, which were consistent with the revised estimates it had calculated during the review. The ERT recommends that Romania update the description of the methodology used to estimate the amount of synthetic nitrogen applied to soils in the NIR and continue to report the estimates for the category without adjustment to account for the amount of nitrogen that volatilizes as ammonia and NO_X.	
LULUCF			
L.12	4. General (LULUCF)	The ERT noted that Romania has not been able to resolve many of the recommendations made in previous review reports for both the LULUCF sector and KP-LULUCF activities. The unresolved recommendations relate to many aspects of the LULUCF inventory, namely transparency (see ID#s L.2, L.4, L.7, KL.1, KL.2, KL.4 and KL.7 in table 3), accuracy (see ID#s L.5 and L.6 in table 3), completeness (see ID#s L.1 and L.8 in table 3) and adherence to the UNFCCC Annex I inventory reporting guidelines (see ID#s L.3 and KL.3 in table 3). Several of these recommendations have been made in at least three review reports (see ID#s L.1, L.6 and L.8 in table 4). Furthermore, the ERT, during the course of the review of the 2018 annual submission, made a number of recommendations relating to transparency, accuracy and adherence to the UNFCCC Annex I inventory reporting guidelines covering most land-use categories (see ID#s L.13–L.22, KL.9 and KL.11 below). The ERT also noted that while Romania listed in the NIR planned improvements for the LULUCF sector, for example those related to the development of a national system to respond to the accounting requirements set out in European Union decision 529/2013/EU, the timeline for the improvements indicates that they will not be completed until the 2020 and 2021 annual submissions. The ERT further noted that substantial progress would have to be made in order for the Party to resolve all the current recommendations.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		The ERT recommends that Romania intensify its efforts to improve the inventory for the LULUCF sector and KP-LULUCF activities.	
L.13	4. General (LULUCF)	The ERT noted that the inter-annual change per area of living biomass and mineral soils between 2014 and 2015 is significant in several land-use conversion categories, namely land converted to forest land, forest land converted to cropland, grassland and settlements, and grassland converted to cropland and settlements. The ERT also noted that for these conversions, the value reported in 2015 was approximately 10 per cent higher than that in 2014. During the review, the ERT determined that since 2015, Romania has used a transition period of 22 years for some land conversions, and this has affected the estimation of annual change per area of living biomass and mineral soils.	Yes. Accuracy
		The ERT recommends that Romania use the same transition period (20 years) throughout the time series for the calculation of emissions from conversions of land use.	
L.14	4. General (LULUCF) – CO_2	During the review, the ERT noted inconsistencies in some land-use conversions with respect to the EF of living biomass before conversion and biomass following conversion. For instance, for grassland converted to other land, the value in the NIR (p.603) is 6.1 t dry matter/ha, from table 6.4 of the 2006 IPCC Guidelines, while in other cases in the NIR (e.g. p.613) Romania used 1.6 t dry matter/ha. In the conversion of all land uses to cropland (subcategory vineyards and orchards), where the Party considers biomass following conversion equivalent to the default value for standing carbon stock of woody biomass in permanent cropland (4.43 t C/ha, using as a reference the value in Hungary's NIR 2014 for vineyards of 15 years of age) in one location in the NIR (p.602), on the same page, there is a value for annual growth of carbon stock (0.3 t C/ha/year for perennial woody plantations less than 14 years of age, using as a reference Hungary's NIR 2014). In the conversion of cropland, grassland, wetlands and settlements to forest land, the data source is the same for the annual increment of forest, yet the change in living biomass is different.	Yes. Accuracy
		The ERT recommends that Romania use the information on carbon stock in living biomass consistently for different conversions of land before conversion and biomass following conversion for all land-use conversions.	
L.15	4. General (LULUCF)	During the review, the ERT noted that Romania has not described some subcategories of land use in the NIR. These subcategories have different parameters of living biomass for the estimation of emissions; for example, grassland has two subcategories (grassland and wooded land grassland), and some wetlands have areas of grass and wet reeds.	Yes. Transparency
		The ERT recommends that Romania include in the NIR a description of the subcategories of land use, including information on the parameters of living biomass considered for each of them.	
L.16	4.A Forest land – CO_2	Romania reported in the NIR (p.587) that it used a carbon fraction of 0.47 t C/t d.m. for forest land, in accordance with the default value in table 4.3 of the 2006 IPCC Guidelines. During the review, the ERT noted that Romania in fact used a carbon fraction of 0.5 t C/d.m.)$^{-1}$ in the calculation of CO_2 emissions in CRF table 4.A. The Party acknowledged this and indicated that it would improve the emission estimates for this category in the next annual submission.	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		The ERT recommends that Romania report the carbon fraction consistently between the NIR and the CRF tables, applying the value from the 2006 IPCC Guidelines (0.47 t C/t d.m.) or, if using a carbon fraction of 0.5 t C/t d.m., that it justify that this value is appropriate for the national circumstances.	
L.17	4.A.1 Forest land remaining forest land – CO_2	In table 6.7 of the NIR, Romania used country-specific EFs for the below-ground biomass to above-ground biomass ratio (R) for various species of trees. During the review, the ERT noted that the values of R presented in table 6.7 do not represent R, but 1 + R. The ERT also noted that this error did not affect the calculation of emissions/removals.	Yes. Transparency
		The ERT recommends that Romania improve the transparency of its reporting by reporting in the NIR the correct below-ground biomass to above-ground biomass ratio for all tree species.	
L.18	4.C.2.1 Forest land converted to grassland – CO_2	Romania provided the national reference carbon stock change value in mineral soils for forest land converted to grassland in table 6.11 of the NIR (–1.74 t C/ha/year), however, in the CRF tables, for 1989 to 2014, the value is –0.42 t C/ha/year, and for 2015 onward, the value is –0.46 t C/ha/year. During the review, the ERT noted that there are two subcategories for grassland (grassland and grassland with wooded land) and that Romania uses a value of zero for the estimation of carbon stock changes in some subcategories. The Party informed the ERT that it would improve the estimations for this category in the next annual submission.	Yes. Accuracy
		The ERT recommends that Romania review the values of carbon stock changes in mineral soils for conversions of forest land to grassland and grassland with wooded land subcategories and, as appropriate, revise the reported estimates.	
L.19	4.B.1 Cropland remaining cropland – CO_2	Romania reported in the NIR (p.604) that it used a value for carbon stock change for organic soils from table 5.6 of the 2006 IPCC Guidelines, specifically the EF for a warm temperate climate (–10 t C/ha/year). However, the ERT noted that in CRF table 4.B the IEF is –2.5 t C/ha/year. During the review, Romania investigated this matter and informed the ERT that it would improve the estimations for this category, using the correct value from the 2006 IPCC Guidelines, in the next annual submission.	Yes. Accuracy
		The ERT recommends that Romania investigate further the applicability of the current EF used for carbon stock change for organic soils in a warm temperate climate (–2.5 t C/ha/year) and, as appropriate, either justify the use of this EF in the NIR, or revise the EF and justify the use of the new EF in the NIR. In the absence of a country-specific EF, the IPCC default EF (–10 t C/ha/year) can be used.	
L.20	4.C.1 Grassland remaining grassland – CO_2	Romania calculated carbon stock changes in organic soils for grassland remaining grassland using an EF of 0.25 t C/ha/year. The ERT noted that the 2006 IPCC Guidelines include information about the loss of carbon in organic soils and provide an EF for grassland remaining grassland in table 6.3 for three climatic zones (whose values are between –0.25 and –5.0 t C/ha/year). During the review, Romania investigated this matter and informed the ERT that it would improve the estimations for this category, using the correct value from the 2006 IPCC Guidelines (0.25 t C/ha/year), in the next annual submission.	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		The ERT recommends that Romania use the correct EF for carbon stock change for organic soils from table 6.3 of the 2006 IPCC Guidelines considering the climatic zones that are appropriate for the country and revise the reported estimates.	
L.21	4.D. Wetlands – CO_2	Romania reported carbon stock change in living biomass for land converted to other wetlands in CRF table 4.D; however, the ERT noted that there is no information in the NIR about living biomass in wetlands. During the review, Romania indicated that it would include a description of this pool, with a justification for the reported AD and EFs, in the next NIR. The ERT recommends that Romania include information in the NIR on carbon stock change in living biomass, including on AD, EFs and any assumptions used to estimate CO_2 emissions from wetlands.	Yes. Transparency
L.22	4.G HWPs – CO_2	Romania reported emissions of CO_2 from HWPs for sawnwood with a single carbon conversion factor adapted to the national conditions (0.268 Mg C/m^3). However, during the review, Romania provided the ERT with a calculation of CO_2 emissions from HWPs with AD separated for sawnwood of coniferous and non-coniferous species. The ERT noted that the Kyoto Protocol Supplement includes different carbon conversion factors for coniferous (0.225 Mg C/m^3) and non-coniferous (0.28 Mg C/m^3) species (table 2.8.1). Considering this information, Romania indicated that it would use different carbon conversion factors for sawnwood of coniferous and non-coniferous species. The ERT recommends that Romania use different carbon conversion factors for coniferous and non-coniferous species in order to more accurately estimate CO_2 emissions from the HWP pool and revise the reported estimates.	Yes. Accuracy
Waste			
W.2	5.A.1 Managed waste disposal sites – CH_4	Romania reported CH_4 recovery and flaring in managed SWDS. The ERT noted, however, that the NIR does not include information on the basis for the reporting of gas recovery quantities. During the review, Romania clarified that data on CH_4 recovery are provided annually by the operators of managed SWDS. The available information indicates that CH_4 is recovered from 17 managed SWDS, and CH_4 for energy purposes is recovered from an additional 4 managed SWDS. According to the questionnaire completed by the operators, data on CH_4 recovery are either measured or estimated. The ERT requested information regarding the QA/QC procedures implemented for the data sources for CH_4 recovery. In response, the Party provided information on the QC activities, which are annually applied, relevant to the primary data on CH_4 recovery. Romania also informed the ERT that QA activities have been implemented in the context of previous studies, the annual inventory review at the EU level and the annual inventory review under decision 406/2009/EC, as well as the previous reviews of annual submissions. The ERT recommends that Romania provide detailed information in the NIR regarding the data sources for CH_4 recovered and flared in managed SWDS for the entire time series, and on the amount of recovered CH_4 that is estimated or measured.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
W.3	5.A.2 Unmanaged waste disposal sites – CH_4	The ERT noted large inter-annual changes in the CH_4 IEF for unmanaged waste disposal sites in recent years. In particular, the CH_4 IEF increased by 77.6 per cent between 2011 (0.07 t/t) and 2012 (0.13 t/t), and by 68.2 per cent between 2015 (0.14 t/t) and 2016 (0.24 t/t). During the review, Romania explained that the inter-annual changes in the CH_4 IEF resulted from variation in the amount of CH_4 recovered. However, the ERT noted that there is CH_4 recovery from managed sites but no CH_4 recovery from unmanaged sites according to the NIR (p.648) and CRF table 5.A. Thus, the ERT requested an explanation for the changes in the CH_4 IEF for unmanaged waste disposal sites. Romania explained that a transcription error had occurred in the CRF tables in the weighted average methane correction factor and stated that the error would be corrected in the next annual submission. In response to the ERT's request for clarification as to whether or not the emission calculations were affected by this error, Romania confirmed that the emission calculations were not affected by this transcription error, which occurs only in the CRF tables. The ERT recommends that Romania provide information in the NIR regarding the calculated weighted average methane correction factor for the entire time series, and correct the transcription errors identified in CRF table 5.A.	Yes. Transparency
W.4	5.B.1 Composting – CH_4 and N_2O	The ERT noted that the NIR (p.656) does not include any information for 2016 data on composting. Furthermore, there is insufficient information in the NIR on the collection of AD (e.g. data are not presented for the entire time series nor assumptions used in the estimation of missing data). During the review, the ERT requested information on the collection of composted municipal solid waste. Romania informed the ERT that, for the period 2003–2016, the data on the amount of municipal solid waste composted were provided by the Waste Directorate of the National Environmental Protection Agency. For 2016, the statistical survey had not yet been finalized at the time the data were needed, so estimated data were used. The ERT recommends that Romania improve the transparency of its reporting by including in the NIR detailed information on the collection of AD on composting for the entire time series and assumptions used in the estimation of missing data for composting.	Yes. Transparency
W.5	5.C.1 Waste incineration – CO_2, CH_4 and N_2O	Table 7.19 of the NIR includes the amounts of clinical waste generated and incinerated. The ERT noted that the amount of clinical waste incinerated (8.02 Gg) is greater than the amount of clinical waste generated (7.72 Gg) for 2016. During the review, Romania clarified that a transcription error had occurred in table 7.19. The Party stated that the amount of clinical waste generated is 10.929 Gg for 2016 and that the error would be corrected in the next annual submission. The ERT requested clarification as to whether or not the emission calculations were affected by this error; Romania confirmed that the error did not affect the emission estimates. The Party noted that the amount of clinical waste generated was provided in the NIR as additional information. The ERT encourages Romania to strengthen its QC procedures for waste incineration to avoid transcription errors in future annual submissions.	Not an issue/problem
W.6	5.C.1 Waste incineration – CO_2	The ERT noted in CRF table 5.C that biogenic CO_2 emissions from waste incineration were reported using the notation key "NE". According to the 2006 IPCC Guidelines, biogenic CO_2 emissions should not be included in the	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		national total emission estimates but should be reported for information purposes. During the review, Romania clarified that it estimates CH_4 and N_2O emissions from waste incineration using the amounts of biogenic waste (industrial non-hazardous waste, veterinary waste, waste from aircraft handling, sewage sludge and slaughter waste). Further, the Party clarified that municipal solid waste is not incinerated. Romania is investigating the possibility of including in the waste sector the CO_2 emissions from the incineration of biogenic waste. The ERT requested information on the obstacles to calculating these emissions. Romania explained that default values on dry matter content are not provided in table 5.2 of the 2006 IPCC Guidelines. In this table, dry matter content is "NA" for the quantities of industrial waste, clinical waste and sewage sludge. The ERT encourages Romania to include in its reporting for the waste sector the CO_2 emissions from the incineration of biogenic waste.	
W.7	5.D.2 Industrial wastewater – CH_4	Table 7.32 of the NIR includes the amounts of CH_4 recovered from industrial wastewater treatment. The ERT noted that the NIR does not include information on the basis for the reporting of gas recovery quantities. During the review, Romania clarified that data on CH_4 recovered from industrial wastewater treatment were collected from four major brewery operators for the years 1998 to 2016. The reported data were measured by three operators; one operator declared the amount of CH_4 flared as being estimated. The ERT requested information regarding the QA/QC procedures implemented for the data sources for CH_4 recovery. In response, the Party informed the ERT that QA activities have been implemented in the context of previous studies, the annual inventory review at the EU level and the annual inventory review under decision 406/2009/EC, as well as the previous reviews of annual submissions. Romania also informed the ERT about QC activities, which are annually applied, relevant to the primary data on CH_4 recovery. The ERT recommends that Romania provide detailed information in the NIR regarding the data sources for CH_4 recovered and flared from industrial wastewater treatment for the entire time series, and on the amount of recovered CH_4 that is estimated or measured.	Yes. Transparency
KP-LULUCF			
KL.8	General (KP-LULUCF)	The definition of forest in the NIR (section 11.2.1) does not include the minimum tree crown cover at maturity. In the NIR 2016 and Romania's report to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7 bis, 8 and 8 bis, of the Kyoto Protocol for the second commitment period, this limit was 10 per cent canopy cover. During the review, Romania explained that it has maintained this parameter for "forest" in the current annual submission, even though the information was omitted from the NIR. The Party indicated that this definition would be included in the next annual submission. The ERT recommends that Romania include in the NIR its definition of forest.	Yes. Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
KL.9	FM – CO_2, CH_4 and N_2O	Romania reported an FM cap of 9,886.351 kt CO_2 eq in the CRF accounting table of the 2018 annual submission. The value reported in the review of the report to facilitate the calculation of the assigned amount for the second commitment period (2013–2020) was 10,672.220 kt CO_2 eq. According to paragraph 12 of decision 6/CMP.9, the	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		FM cap shall remain fixed for the second commitment period of the Kyoto Protocol. During the review, the Party noted that a transcription error had occurred and it would be corrected in the next annual submission. The ERT recommends that Romania revise the FM cap in the CRF accounting table such that it is consistent with the value reported in the review of the report to facilitate the calculation of the assigned amount for the second commitment period (2013–2020) of the Kyoto Protocol.	
KL.10	FM – CO_2	The ERT noted that Romania identified the need for a technical correction to the FMRL in the report to facilitate the calculation of the assigned amount for the second commitment period (2013–2020). In addition, the ERT identified the need for a technical correction owing to inconsistencies in the use of data on salvage logging (see ID# KL.1 in table 3). Since the adoption of the FMRL, there have also been substantial changes in the methodologies used for land area representation and changes in the estimation of HWPs. During the review, on the basis of the fact that new national forest inventory data will become available in the coming years, Romania explained that a technical correction would be applied in the future. The ERT noted, however, that it is good practice (see section 2.7.5.2 of the Kyoto Protocol Supplement) to specify the methodological elements or historical activity used in the reporting of FM emissions and removals, which are different from those used for calculating the FMRL, as outlined in decision 2/CMP.7, annex, paragraphs 14 and 15. The ERT, underlining the fact that a technical correction is only applicable when a Party uses end of commitment period accounting, recommends that Romania provide in the NIR a list summarizing any methodological inconsistencies that may trigger a technical correction.	Yes. Transparency
KL.11	HWPs – CO_2	Romania revised the methodology for the HWP pool in the LULUCF sector in the 2018 annual submission but it did not incorporate the updated methodology into its reporting of KP-LULUCF activities. In addition, while the Party included a paragraph in the planned improvements section of the NIR (table 10.5) about HWPs under KP-LULUCF activities, this paragraph actually refers to recalculations and not planned improvements, and does not explain how the Party will incorporate the revised methodology applied to HWPs in the LULUCF sector to KP-LULUCF activities. The ERT recommends that Romania include information on the new estimation methodology for the HWP pool in its reporting of KP-LULUCF activities, and clarify how this new estimation will affect the FMRL.	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2018 annual submission of Romania.

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

12. Romania has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2018 review.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the individual review of the 2018 annual submission.

Annex I

Overview of greenhouse gas emissions and removals for Romania for submission year 2018 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Romania in its 2018 annual submission

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by Romania.

Table 6
Total greenhouse gas emissions for Romania, base year[a]–2016
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–15 444.00
Base year	286 311.04	304 946.58	NA	NA	NA		–1 698.59	
1990	228 256.73	248 847.39	NA	NA				
1995	161 875.87	183 521.54	NA	NA				
2000	126 244.84	149 103.48	NA	NA				
2010	106 293.64	129 305.88	NA	NA				
2011	111 216.85	134 714.47	NA	NA				
2012	106 160.35	131 392.05	NA	NA				
2013	95 823.41	121 646.62	NA	NA		7 723.95	–1 211.36	–27 459.97
2014	96 043.80	121 528.58	NA	NA		7 730.09	–1 222.00	–27 479.10
2015	98 733.10	122 084.46	NA	NA		7 730.19	–1 258.62	–27 854.57
2016	93 939.45	118 231.77	NA	NA		7 730.26	–1 309.34	–27 867.18

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

[a] Base year refers to the base year under the Kyoto Protocol, which is 1989 for all gases except NF_3, for which the base year is 2000. The base year for RV under Article 3, paragraph 4, of the Kyoto Protocol is 1989 for Romania. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has not reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

Table 7
Greenhouse gas emissions by gas for Romania, excluding land use, land-use change and forestry, 1989–2016
(kt CO_2 eq)

	CO_2[a]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1989	209 595.92	72 191.04	18 712.99	0.16	4 446.00	NO	0.47	NO
1990	171 231.79	59 021.85	15 784.67	0.18	2 808.43	NO	0.47	NO
1995	124 836.93	44 839.37	11 487.66	2.53	2 354.07	NO	0.98	NO
2000	93 538.38	44 365.04	9 445.84	70.82	1 674.72	NO	8.68	NO
2010	83 551.26	37 022.64	7 679.68	982.46	9.13	NO	60.71	NO
2011	89 343.22	36 212.57	8 005.99	1 092.14	12.72	NO	47.83	NO
2012	86 320.93	36 533.13	7 282.52	1 197.29	7.43	NO	50.76	NO
2013	76 829.20	35 989.96	7 465.66	1 298.45	6.15	NO	57.20	NO
2014	77 160.49	35 757.68	7 179.19	1 373.10	6.34	NO	51.78	NO
2015	77 788.22	35 290.02	7 310.62	1 636.76	6.57	NO	52.27	NO
2016	75 051.66	34 079.77	7 150.90	1 894.11	5.44	NO	49.88	NO
Per cent change 1989–2016	**–64.2**	**–52.8**	**–61.8**	**1 212 983.6**	**–99.9**	**NA**	**10 402.7**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] Romania did not report indirect CO_2 emissions in CRF table 6.

Table 8
Greenhouse gas emissions by sector for Romania, 1989–2016
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1989	216 112.49	44 672.97	39 025.46	–18 635.55	5 135.66	
1990	176 122.09	32 154.49	35 547.45	–20 590.66	5 023.36	
1995	130 157.35	24 030.28	24 176.64	–21 645.67	5 157.27	
2000	105 620.32	19 186.62	18 992.62	–22 858.64	5 303.93	
2010	91 234.18	14 446.30	18 041.23	–23 012.24	5 584.18	
2011	96 237.81	15 135.95	18 308.39	–23 497.62	5 032.30	
2012	93 835.37	13 800.49	18 135.82	–25 231.70	5 620.38	
2013	85 008.72	12 015.14	18 737.82	–25 823.22	5 884.95	
2014	84 384.34	12 555.29	18 725.08	–25 484.78	5 863.88	

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
2015	84 300.09	12 760.70	19 161.96	–23 351.35	5 861.71	
2016	80 581.55	12 942.22	18 859.78	–24 292.32	5 848.21	
Per cent change 1989–2016	**–62.7**	**–71.0**	**–51.7**	**30.4**	**13.9**	**NA**

Notes: (1) Romania did not report emissions/removals in the sector other (sector 6); the corresponding cells in the CRF tables were blank; (2) Romania did not report indirect CO_2 emissions in CRF table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2016, for Romania

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–15 444.00				
Technical correction				–3 665.25				
Base year	NA				NO, NA	NO, NA	–1 698.59	NO, IE, NA
2013		–352.31	8 076.26	–27 459.97	NO, NA	NO, NA	–1 211.36	IE, NA, NO
2014		–346.17	8 076.26	–27 479.10	NA, NO	NA, NO	–1 222.00	NA, NO, IE
2015		–346.07	8 076.26	–27 854.57	NO, NA	NO, NA	–1 258.62	NO, IE, NA
2016		–346.00	8 076.26	–27 867.18	NO, NA	NO, NA	–1 309.34	NO, IE, NA
Per cent change Base year–2016					**NA**	**NA**	**–22.9**	**NA**

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

[a] The base year for RV under Article 3, paragraph 4, of the Kyoto Protocol is 1989 for Romania. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for Romania's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Romania under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in the 2018 annual submission

Key parameters	*Values*
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: commitment period accounting (g) WDR: not elected
Election of activities under Article 3, paragraph 4	RV
Election of application of provisions for natural disturbances	Yes, for AR and FM
3.5% of total base-year GHG emissions, excluding LULUCF	10 672.220 kt CO_2 eq (85 377.759 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2016	NA
2. Deforestation in 2016	NA
3. FM in 2016	NA
4. CM in 2016	NA
5. GM in 2016	NA
6. RV in 2016	NA
7. WDR in 2016	NA

Annex II

Information to be included in the compilation and accounting database

Tables 11–14 include the information to be included in the compilation and accounting database for Romania. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2016, including on the commitment period reserve, for Romania
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	590 453 541			590 453 541
Annex A emissions for 2016				
CO_2	75 051 657			75 051 657
CH_4	28 551 598	34 079 768		34 079 768
N_2O	6 989 668	7 150 904		7 150 904
HFCs	1 894 115			1 894 115
PFCs	5 442			5 442
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	49 884			49 884
NF_3	NO			NO
Total Annex A sources	**112 542 364**	**118 231 770**		**118 231 770**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2016				
3.3 AR	–345 996			–345 996
3.3 Deforestation	8 076 258			8 076 258
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2016				
3.4 FM	–27 867 177			–27 867 177
3.4 RV	–1 309 343			–1 309 343
3.4 RV in the base year	–1 698 592			–1 698 592

Table 12
Information to be included in the compilation and accounting database for 2015, for Romania
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2015				
CO_2	77 788 220			77 788 220
CH_4	29 584 055	35 290 017		35 290 017
N_2O	7 143 441	7 310 619		7 310 619
HFCs	1 636 762			1 636 76
PFCs	6 567			6 567
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	52 271			52 271
NF_3	NO			NO

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Total Annex A sources	**116 211 316**	**122 084 456**		**122 084 456**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	–346 067			–346 067
3.3 Deforestation	8 076 258			8 076 258
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	–27 854 573			–27 854 573
3.4 RV	–1 258 616			–1 258 616
3.4 RV in the base year	–1 698 592			–1 698 592

Table 13
Information to be included in the compilation and accounting database for 2014, for Romania
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2	77 160 487			77 160 487
CH_4	29 742 201	35 757 685		35 757 685
N_2O	7 037 297	7 179 188		7 179 188
HFCs	1 373 099			1 373 099
PFCs	6 345			6 345
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	51 781			51 781
NF_3	NO			NO
Total Annex A sources	**115 371 211**	**121 528 585**		**121 528 585**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–346 167			–346 167
3.3 Deforestation	8 076 258			8 076 258
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–27 479 098			–27 479 098
3.4 RV	–1 222 003			–1 222 003
3.4 RV in the base year	–1 698 592			–1 698 592

Table 14
Information to be included in the compilation and accounting database for 2013, for Romania
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2	76 829 198			76 829 198
CH_4	29 766 69	35 989 964		35 989 964
N_2O	7 304 569	7 465 660		7 465 660
HFCs	1 298 450			1 298 450
PFCs	6 149			6 149
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	57 203			57 203
NF_3	NO			NO
Total Annex A sources	**115 262 268**	**121 646 624**		**121 646 624**

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–352 308			–352 308
3.3 Deforestation	8 076 258			8 076 258
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–27 459 967			–27 459 967
3.4 RV	–1 211 356			–1 211 356
3.4 RV in the base year	–1 698 592			–1 698 592

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which 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 reporting in the Party's inventory are the following:

(a) N_2O emissions from rabbits in category 3.B (manure management) (see ID#s G.1 and A.5 in table 3);

(b) CO_2 emissions from wetlands converted to grassland (all carbon pools) under category 4.C.2.3 (see ID# L.1 in table 3);

(c) CO_2 emissions from DOM in wetlands converted to cropland under category 4.B.2.3 (see ID# L.1 in table 3);

(d) CO_2 emissions from living biomass and DOM in settlements converted to cropland under category 4.B.2.4 (see ID# L.1 in table 3);

(e) CO_2 emissions from DOM in cropland converted to grassland under category 4.C.2.2 (see ID# L.1 in table 3);

(f) CO_2 emissions from mineral soils from grassland remaining grassland under category 4.C.1 (see ID# L.8 in table 3).

Annex IV

Documents and information used during the review

A. Reference documents

IPCC reports

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL 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 http://www.ipcc-nggip.iges.or.jp/public/gp/english/.

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

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2012, 2013, 2014, 2015 and 2016 annual submissions of Romania contained in documents FCCC/ARR/2012/ROU, FCCC/ARR/2013/ROU, FCCC/ARR/2014/ROU, FCCC/ARR/2015/ROU and FCCC/ARR/2016/ROU, 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/sites/default/files/resource/AGI%20report_2018.pdf.

Annual status report for Romania for 2018. Available at https://unfccc.int/sites/default/files/resource/asr2018_ROU.pdf.

European Environment Agency. 2016. *EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016*. Luxembourg City: Publications Office of the European Union. Available at https://www.eea.europa.eu/publications/emep-eea-guidebook2016.

National Environmental Protection Agency of Romania. 2016. Report to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7bis, 8 and 8bis, of the Kyoto Protocol for the second commitment period. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-kyoto-protocol/second-commitment-period/initial-reports.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Sorin Deaconu (National Environmental Protection Agency), including additional material on the

methodology and assumptions used. The following documents[1] were also provided by Romania:

European Commission (October 2012). Guidance document. The Monitoring and Reporting Regulation – Guidance on Sampling and Analysis. MRR Guidance document No. 5. Available online at https://ec.europa.eu/clima/policies/ets/monitoring_en#tab-0-1.

Institutel de Studil și Proiectări Energetice S.A (2011). Capitolul 5: Emisii fugitive datorate manipulării combustibililor fosili (Chapter 5: Fugitive emissions due to the handling of fossil fuels). Document code: 7135/2011-1.1-S0026948-B2.

Popa O, M. Milos, P. Halga, E. Bunicelul (1980) Alimentaţia animalelor domestice (Feeding of domestic animals), EDP Publishing House, Bucharest.

Stoica I. (1997), Nutriţia si alimentaţia animalelor (Animal nutrition and nutrition), Coral Sanivet Publishing House, Bucharest.

[1] Reproduced as received from the Party.