COMPLIANCE COMMITTEE **CC/ERT/ARR/2017/4**
16 March 2017

Report of the individual review of the annual submission of Hungary submitted in 2016

Note by the secretariat

The report of the individual review of the annual submission of Hungary submitted in 2016 was published on 10 March 2017. 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/2016/HUN, 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.

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Report on the individual review of the annual submission of Hungary submitted in 2016*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG 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 required 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 2016 annual submission of Hungary, 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 19 to 24 September 2016 in Budapest, Hungary.

* In the symbol for this document, 2016 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

I. Introduction[1]

1. This report covers the review of the 2016 annual submission of Hungary organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in the "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" (hereinafter referred to as the UNFCCC review guidelines) and particularly part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 19 to 24 September 2016 in Budapest, Hungary, and was coordinated by Mr. Nalin Srivastava and Mr. Davor Vesligaj (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of Hungary.

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

Area of expertise	*Name*	*Party*
Generalist	Ms. Maria Lidén	Sweden
Energy	Ms. Maria Lidén	Sweden
IPPU	Mr. Joseph Baffoe	Ghana
Agriculture	Mr. Kohei Sakai	Japan
LULUCF	Mr. Emil Cienciala	Czechia
Waste	Mr. Qingxian Gao	China
Lead reviewers	Mr. Qingxian Gao	
	Ms. Maria Lidén	

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

2. This report contains findings based on the assessment by the ERT of the 2016 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings, and if applicable, the ERT's encouragements to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Hungary, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

[1] At the time of publication of this report, Hungary 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.

4. Annex I shows annual greenhouse gas (GHG) emissions for Hungary, including totals excluding and including the land use, land-use change and forestry (LULUCF) sector, indirect carbon dioxide (CO_2) emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and, additional activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), if elected, by gas, sector and activity for Hungary.

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

6. The ERT notes that Hungary's 2015 annual submission was delayed, consistent with decision 6/CMP.9, paragraph 4. As a result, the review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission, in accordance with decision 10/CMP.11, paragraph 1. To the extent that identical information is presented in both annual submissions, the ERT has reviewed this information only once, and, as appropriate, has replicated the findings below in both the 2015 and the 2016 annual review reports.

II. Summary and general assessment of the 2016 annual submission

7. Table 2 provides the ERT assessment 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 below.

Table 2
Summary of review results and general assessment of the inventory of Hungary

Assessment				*Issue or problem ID# in tables 3 and/or 5*[a]
Date of submission	Original submission: 15 June 2016 (NIR), 15 June 2016, v2 (CRF tables), 15 April 2016 (SEF-CP2-2015 tables) 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)	Have any issues been identified in the following areas:			
	1.	Identification of key categories	No	
	2.	Selection and use of methodologies and assumptions	Yes	E.16, I.7
	3.	Development and selection of emission factors	Yes	I.8, I.9, L.9
	4.	Collection and selection of activity data	Yes	I.12
	5.	Reporting of recalculations	No	I.1
	6.	Reporting of a consistent time series	Yes	E.14, A.15
	7.	Reporting of uncertainties, including methodologies	No	
	8.	QA/QC	QA/QC procedures were assessed in the context of the national system	

Assessment			*Issue or problem ID# in tables 3 and/or 5*[a]
		(see below)	
	9. Missing categories/completeness[b]	Yes	G.1, L.11
	10. 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	
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:		
	1. 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	
	2. 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	
	3. ERUs, CERs, AAUs and RMUs and information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR	No	
	4. 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, including any changes since the previous annual submission	Yes	G.6
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance	No	

Assessment			*Issue or problem ID# in tables 3 and/or 5*[a]
	with decision 2/CMP.7, annex, paragraph 14		
	(c) The Party has reported information in accordance with decision 6/CMP.9	No	
	(d) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	NA	
	(e) Other issues	No	
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	
	The ERT accepts that the revised estimates submitted by Hungary in its 2016 submission can replace a previously applied adjustment in the compilation and accounting database	NA	
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	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction unit, CPR = commitment period reserve, CP2 = second commitment period, CRF = common reporting format, ERT = expert review team, ERU = emission reduction unit, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NIR = national inventory report, QA/QC = quality assurance/quality control, RMU = removal unit, SEF = standard electronic format, SIAR = standard independent assessment report, 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", Wetlands Supplement = *2013 Supplement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] The ERT identified additional issues in the energy, IPPU, agriculture, LULUCF and waste sectors and for KP-LULUCF activities that are not specifically listed in table 2 but are included in tables 3 and/or 5.

[b] Missing categories, for which methods are provided in the *2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories*, may affect completeness and are listed in annex III to this document.

III. Status of implementation of issues and/or problems raised in the previous review report

8. Table 3 compiles all the recommendations made in the previous review report. Owing to the unique circumstances of the 2015 annual submission described in paragraph 6 above, the latest available review report was for the review of the 2014 annual submission, published on 30 December 2014. 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 2016 annual submission and provided the rationale for its determination, taking 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 Hungary

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
General			
G.1	Annual submission (table 3, 2014) Completeness*	Estimate and report the carbon stock changes and emissions/removals from all mandatory categories in the LULUCF sector	Not resolved. The Party has not reported carbon stock changes in litter pool in land converted to forest land (4.A.2). See L.11 and I.11
G.2	QA/QC and verification (12, 2014) (16, 2013) Transparency*	Include in the NIR all relevant information on QA activities carried out for the annual submission	Not resolved. The current QA/QC plan does not clearly distinguish between QA and external QC checks (see G.4), so the ERT was unable to assess whether all QA procedures are included in the NIR
G.3	QA/QC and verification (12, 2014) Transparency*	Include in the NIR a summary of the results of the QA activities carried out each year	Not resolved. A summary of the results of the QA activities is not included in the NIR
G.4	QA/QC and verification (13, 2014) Transparency*	Revise the QA/QC plan in order to clearly distinguish between QC checks (e.g. LULUCF sector checks, EU completeness checks) and QA procedures	Not resolved. The NIR does not include separate information on QA procedures. In the QA/QC plan provided in annex 5 to the NIR, the column "QA" still includes mostly external QC checks
G.5	National system (91, 2014) Transparency*	Clearly indicate the required information on the national system in the NIR	Resolved. The required information is included in section 1.2 of the NIR
G.6	Article 3, paragraph 14, of the Kyoto Protocol (95, 2014) (126, 2013)	Report any change(s) in the information provided under Article 3, paragraph 14	Not resolved. Although the NIR includes information provided under Article 3, paragraph 14, of the Kyoto

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	(148, 2012) Transparency*		Protocol, it does not provide information on the changes made since the previous submission
Energy			
E.1	1.A.1 Energy industries – solid fuels – CO_2 (27, 2014) Comparability*	Review the approach used to account for emissions from coal and petroleum coke that serve as additives for increasing the porosity of bricks and revise the estimates, where appropriate	Resolved. Hungary has consistently included emissions from coal and petroleum coke use under the energy sector in line with the energy statistics, instead of providing that information under the IPPU sector
E.2	1.A.1 Energy industries – other fuels – CO_2 (28, 2014) Transparency*	Include in the NIR an explanation for the increase in the CO_2 IEF for other fuels between 2011 and 2012	Resolved. Section 3.2.5.2 of the NIR provides an explanation for the trend of the IEF for CO_2 from waste incineration through a discussion on the EFs, AD and IEF
E.3	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O (29, 2014) Accuracy*	Carry out a study in order to identify how aviation gasoline and gasoline used in road transportation can be separated	Resolved. Hungary has allocated small amounts of gasoline consumption to domestic aviation based on EUROCONTROL data. Data collected from smaller airports confirms the reasonableness of the estimates based on EUROCONTROL data
E.4	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O (29, 2014) (49, 2013) (55, 2012) Accuracy*	Report the emissions from gasoline used for civil aviation separately from gasoline used for road transportation	Resolved. See E.3
E.5	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O (30, 2014) Accuracy*	Investigate the accuracy of the information provided by EUROCONTROL regarding jet kerosene use for domestic flights and make any necessary revisions to the estimates	Resolved. During the review, Hungary provided the ERT with information confirming the accuracy and reliability of the EUROCONTROL data
E.6	1.A.3.b Road transportation – liquid fuels – CH_4 (32, 2014) (53, 2013)	Improve the time-series consistency of CH_4 emissions from gasoline and explain any resulting recalculations	Resolved. Hungary has recalculated the whole time series of non-CO_2 emissions using the COPERT 4 model, which has resulted in some

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report[c]	ERT assessment and rationale
	Consistency*		improvement in the time-series consistency. Hungary has also described the recalculations in the NIR. However, the ERT notes that the Party needs to make further efforts to ensure time-series consistency because different versions of the COPERT model have been used for the years 1985–2013 and for 2014, and the underlying databases are not yet fully consistent. See E.14
E.7	1.A.3.b Road transportation – liquid fuels – N_2O (32, 2014) Consistency*	Improve the time-series consistency of N_2O emissions from gasoline	Resolved. See E.6 above
E.8	1.A.3.b Road transportation – biomass – CH_4 and N_2O (33, 2014) Accuracy*	Consider reporting CH_4 and N_2O emissions from biofuels under biomass, and provide in the NIR the relevant explanations	Resolved. Hungary has reported the CH_4 and N_2O emissions from biofuels separately under biomass for the entire time series, and has described, in the NIR, the methodology used (pp. 61–67)
E.9	1.A.3.b Road transportation – biomass –N_2O (33, 2014) Accuracy*	Review the consistency of the approach used to estimate CH_4 and N_2O emissions from biogasoline and biodiesel for the entire time series	Resolved. See E.8 above
E.10	1.B.1.b Solid fuel transformation – solid fuels – CO_2 (34, 2014) Transparency*	Explain in the NIR which solid fuel transformation processes, if any, occur in the country in addition to coking, and in which categories the respective CO_2 emissions are reported	Resolved. The NIR provides the requested explanation regarding this category (p. 73)
E.11	1.B.1.b Solid fuel transformation – solid fuels – CH_4 (34, 2014) (56, 2013) Transparency*	Review the use of the notation key “NO” for CH_4 emissions	No longer relevant. Hungary has revised the notation key for emissions of all gases from this category to “IE” (including them in CRF table 1.A.1.c). According to the information provided in the NIR, it is not possible to separate fugitive emissions from coke and charcoal

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
			production owing to a lack of methodology for estimating such emissions in the 2006 IPCC Guidelines. During the review, Hungary informed the ERT that the notation key will be revised to "NE" in the next submission. The ERT agrees with this suggestion
E.12	1.B.2 Oil and natural gas and other – liquid and gaseous fuels – CO_2, CH_4 and N_2O (31, 2014) Transparency*	Improve the transparency of the NIR by further elaborating on the use of different data sources to estimate fugitive emissions	Addressing. The information in the NIR on fugitive emissions from this category is still very brief. During the review, Hungary provided the ERT with detailed information on sources of AD and the EFs for all subcategories
IPPU			
I.1	2. General (IPPU) (36, 2014) Transparency*	Provide more information on the reasons for, and methods used in, the recalculations	Addressing. Hungary has provided in the NIR more information on the reasons for, and methods used in, the recalculations for most categories. However, the ERT notes that the NIR does not include transparent information on recalculations conducted for foam blowing (2.F.2)
I.2	2. General (IPPU) (37, 2014) (58, 2013) (59, 2012) Transparency*	Provide information on QA/QC procedures for all categories	Addressing. Hungary has provided in the NIR more information on the QA/QC procedures for some categories (e.g. lime production). However, the ERT notes that the NIR does not include transparent information on QA/QC procedures for cement production (2.A.1), other process uses of carbonates (2.A.4.d), ferroalloy production (2.C.2), other product use (2.D), other applications (2.G.2) and use of N_2O (2.G.3)

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
I.3	2. General (IPPU) (38, 2014) (58, 2013) (59, 2012) Transparency*	Continue the efforts to further improve the description of uncertainties in the category-specific sections in the NIR by including information on AD and EF uncertainties	Resolved. Hungary has provided a description of uncertainties for AD and EF in specific category sections in the NIR
I.4	2.A.1 Cement production – CO_2 (39, 2014) Transparency*	Include in the NIR the information regarding the application of an average CO_2 IEF for the years prior to 2005	Resolved. Hungary has included in the NIR information on the recalculation performed for this category (p. 90). However, because of a decreasing trend of the CO_2 IEF between 2005 and 2013, Hungary has used a different approach (i.e. using the IEF value for 2005) to extrapolate the emissions to earlier years. See I.9
I.5	2.A.1 Cement production – CO_2 (39, 2014) (59, 2013) (60, 2012) Consistency*	Implement the planned recalculation to apply an average CO_2 IEF derived from the EU ETS data from 2005 onwards to years prior to 2005	Resolved. Hungary has implemented the planned recalculations for the category. See I.9
I.6	2.A.3 Glass production – CO_2 (40, 2014) (59, 2013) (60, 2012) Accuracy*	Improve the CO_2 EF for the years prior to 2005, taking into account the effect of different carbonate contents of raw materials used for different glass types	Resolved. Hungary has improved the EF for the years prior to 2005 by taking into account the different carbonate content of the raw materials used for different glass types
I.7	2.A.4 Other process uses of carbonates – CO_2 (41, 2014) Accuracy*	Carry out the planned investigation regarding the assumption underpinning the addition of 10% to the data reported under the EU ETS for 2005 and onwards, as well as the use of the 10% higher EF for the period 1985–2004 to account for bricks and ceramics manufacturers not included in the EU ETS and improve the estimates accordingly to ensure time-series consistency	Addressing. The Party has not yet concluded its investigation of the assumption regarding the bricks and ceramics manufacturers not included in the EU ETS
I.8	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (42, 2014) (62, 2013) Accuracy*	Make efforts to collect relevant data from companies and develop a country-specific value for recovery efficiency for refrigeration and air-conditioning equipment, and include all the information related to the estimation of disposal emissions in the NIR	Not resolved. Hungary has not developed a country-specific value for recovery efficiency for the refrigeration and air-conditioning equipment regarding HFC and PFC emissions and continues to use the default value of 0%

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
Agriculture			
A.1	3. General (agriculture) (46, 2014) (70,71, 2013) Transparency*	Report the animal numbers consistently in all NIR tables	Addressing. The ERT noted inconsistency in the information reported in NIR tables 5.2.1 and 5.2.2. During the review, Hungary provided correct animal population data rounded to the nearest hundred instead of the nearest thousand, addressing the inconsistency across the different NIR tables
A.2	3. General (agriculture) (47, 2014) Transparency*	Use the population data rounded to the nearest hundred instead of the nearest thousand	Resolved. The Party has used the population data rounded to the nearest hundred instead of the nearest thousand in its calculations
A.3	3.A Enteric fermentation – CH_4 (49, 2014) Transparency*	Include the information on the calculation of body mass for dairy cattle and non-dairy cattle in the NIR	Resolved. The Party has included in the NIR the requested information (p. 170)
A.4	3.A Enteric fermentation – CH_4 (50, 2014) Transparency*	Include in the NIR a summary of the information regarding the methodology used to calculate the net energy intake	Resolved. The Party has included in the NIR the requested information (pp. 171 and 172)
A.5	3.D.a Direct N_2O emissions from managed soils – N_2O (51, 2014) (74, 2013) Transparency*	Include the outcome of the communications with FAOSTAT regarding cultivation of histosols in the NIR	Resolved. The Party has included in the NIR (p. 205) the outcome of the communications with FAO and EC-JRC regarding cultivation of organic soils
LULUCF			
L.1	4.A Forest land – CO_2, CH_4 and N_2O (55, 2014) Transparency	Explain in the documentation box in CRF table 5.A that the subcategory "other" is permanently unstocked areas, and make reference to page 222 of the NIR, where it is explained why the unstocked areas are included in forest land	Resolved. The Party has included the requested information in CRF table 4.A
L.2	4.A Forest land – CO_2, CH_4 and N_2O (56, 2014) Transparency	Report "found forests" as part of managed lands and complete the process of the reallocation of these areas into the relevant categories	Resolved. The Party has allocated "found forests" to managed forest land
L.3	4.A.2.1 Cropland converted to forest land – CO_2, CH_4 and	Increase the transparency of the justification for reporting emissions from dead organic matter in cropland converted to forest land as "NO", by	Resolved. The Party has provided further information to justify its reporting of

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	N_2O (58, 2014) Transparency	providing the information on the country-specific research findings, or other relevant information, relating to this pool	emissions and removals from this category as "NO" based on the conservativeness of such an assumption (NIR, p. 272). The ERT, however, notes that there are other issues with the Party's reporting on this category that have not been addressed. See L.11
L.4	4.A.2.2 Grassland converted to forest land – CO_2, CH_4 and N_2O (59, 2014) (91, 2013) (101, 2012) Accuracy	Estimate and report the changes in carbon stock in soils in grassland converted to forest land	Resolved. The Party has estimated and reported changes in carbon stocks in mineral soils in grassland converted to forest land based on country-specific values of soil organic carbon for forest land, cropland and grassland
L.5	4.A.2.2 Grassland converted to forest land – CO_2, CH_4 and N_2O (59, 2014) Transparency	If the Party considers that carbon stock changes in soils in grassland converted to forest land are not occurring, provide a justification for the reporting of the notation key "NO"	Resolved. See L.4 above
L.6	4.A.1 Forest land remaining forest land – CO_2, CH_4 and N_2O (60, 2014) (83, 2013) Transparency	Report in the CRF tables the area affected by wildfires for forest land remaining forest land	Resolved. The area affected by wildfires for forest land remaining forest land has been reported in CRF table 4(V)
L.7	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (60, 2014) (83, 2013) Completeness	Report the emissions from wildfires on land converted to forest land	Resolved. Hungary has reported CH_4 and N_2O emissions in CRF table 4(V), while CO_2 emissions from biomass burning are included in carbon stock changes in biomass reported in CRF table 4.A
L.8	4.A Forest land – CO_2, CH_4 and N_2O (60, 2014) Transparency	Resolve the inconsistencies in the reporting of area of forest land affected by wildfires between CRF table 5(V) and the NIR	Resolved. The inconsistency regarding area of forest land affected by wildfires is resolved between CRF table 4(V) and NIR (p. 267)
L.9	4.C.1 Grassland remaining grassland – CO_2 (61, 2014) Accuracy	Develop country-specific values for the carbon stock changes in biomass under different conditions	Not resolved. The Party has reported the carbon stock changes in biomass using the tier 1 assumption in the 2006 IPCC Guidelines (i.e. no

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
			change in carbon stocks)
Waste			
W.1	5. General (waste) (64, 2014) Transparency*	Incorporate in the NIR the clarification regarding the reclassification of landfills from managed to unmanaged from 1950 to 2000	Resolved. Hungary has provided in the NIR (p. 313) information about the reclassification of landfills from managed to unmanaged from 1950 to 2000
W.2	5.D Wastewater treatment and discharge – CH_4 (71, 2014) Transparency*	Include in the NIR the clarification regarding the COD value used for the pulp and paper industry	Resolved. Hungary has provided in the NIR (p. 323) country-specific data on industrial wastewater for different types of wastewater in terms of BOD and has also indicated the default conversion factor for COD
W.3	5.C.1 Waste incineration – CO_2, CH_4 and N_2O (73, 2014) Transparency*	Use the notation key "NO" in CRF table 6.C for the years during which all waste incineration occurred with energy recovery	Resolved. The notation key has been changed to "NO"
KP-LULUCF			
		There were no recommendations related to KP-LULUCF in the previous review report	

Abbreviations: AD = activity data, BOD = biological oxygen demand, COD = chemical oxygen demand, CRF = common reporting format, EC-JRC = European Commission Joint Research Centre, EF = emission factor, ERT = expert review team, EU = European Union, EU ETS = European Union Emissions Trading System, FAO = Food and Agriculture Organization of the United Nations, FAOSTAT = Food and Agriculture Organization of the United Nations Statistics Division, IE = included elsewhere, IEF = implied emission factor, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, 2006 IPCC Guidelines = *2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories*.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are further classified as defined in decision 13/CP.20, annex, paragraph 81. In the review of the supplementary information reported in accordance with Article 7, paragraph 1, of the Kyoto Protocol, the ERT has applied the classification in decision 22/CMP.1, annex, paragraph 69, in conjunction with decision 4/CMP.11.

[b] An asterisk is included next to each issue type for all issues that are also problems, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] The review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission, and as such, the 2015 annual review report was not available at the time of this review. Therefore, the recommendations reflected in table 3 are from the 2014 annual review report. For the same reason, the year 2015 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 2016 annual submission of Hungary, and have not been addressed by the Party.

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

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
General		
G.2	Include in the NIR all relevant information on QA activities carried out for the annual submission	3 (2013–2015/2016)
G.6	Report any change(s) in the information provided under Article 3, paragraph 14, of the Kyoto Protocol	4 (2012–2015/2016)
Energy		
	No such issues for the energy sector were identified	
IPPU		
I.2	Provide information on QA/QC procedures for all categories	3 (2012–2015/2016)
I.8	Make efforts to collect relevant data from companies and develop a country-specific value for recovery efficiency for refrigeration and air-conditioning equipment, and include in the NIR all the information related to the estimation of disposal emissions	3 (2013–2015/2016)
Agriculture		
A.1	Report the animal numbers consistently in all NIR tables	3 (2013–2015/2016)
LULUCF		
	No such issues for the LULUCF sector were identified	
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, QA/QC = quality assurance/quality control.

[a] The review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission. As the reviews of the 2015 and 2016 annual submissions are not "successive" reviews, but are rather being held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 is considered as one year. The ERT noted that this table 4 is the same as that in the 2015 annual review report for Hungary, modified to reflect the combined 2015/2016 review.

V. Additional findings made during the 2016 technical review

10. Table 5 contains findings made by the ERT during the technical review of the 2016 annual submission of Hungary that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2016 technical review of the annual submission of Hungary

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
General			
G.7	Further improvements (identified by the Party)	Currently, the Hungarian GHG inventory preparation is entirely based on Excel spreadsheets. During the review, Hungary informed the ERT about its plan to develop an integrated database system (National Greenhouse Gas Database (NÜA)) to facilitate the compilation and reporting of information including the GHG inventory, policies, measures and projections. The ERT noted the usefulness of the planned database system and commends Hungary for its efforts. However, given the challenges in the development of new data systems, the ERT further noted that it might be helpful for Hungary to: seek advice on best practices from other Parties that have developed, or are in the process of developing, similar data systems; develop and implement parts of the system in a stepwise manner; keep the current Excel-based data system intact until the NÜA is verified to be fully functioning; and in case of significant challenges in the development of the NÜA, as a backup plan, consider moving to script-based calculation and compilation, using appropriate commonly available software	Not an issue
G.8	Recalculations	The Party submitted its original 2015 NIR on 16 November 2015. On 15 June 2016, the Party resubmitted its 2016 submission indicating that the official inventory submission of 2016 constitutes a submission under the Convention for the year 2016, a resubmission under the Convention for the year 2015 and a submission under the Kyoto Protocol for the years 2015 and 2016. The ERT noted that the 2016 submission contains only information on recalculations between the original 2015 submission and the 2016 submission, and that information on the full extent of recalculations between the 2014 submission and the final 2015 submission is not included. The ERT concludes that the reporting is not transparent but noted that this situation was related to the unique circumstances referred to in paragraph 6 above	Not an issue
G.9	QA/QC and	During the review, Hungary informed the ERT about its informal plans for regional cooperation on GHG inventory QA activities with neighbouring countries. The ERT noted the	Not an issue

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
	verification	usefulness of this approach and that it might also be useful for Hungary to develop QA activities together with relevant national organizations	
G.10	Transparency	The ERT noted the many issues relating to lack of transparency in the information provided in the NIR on all the sectors, as also reflected in the sectoral findings in this report. The ERT further noted that, with regard to most issues, Hungary was able to provide detailed explanations that allowed the ERT to confirm that the reported emission/removal estimates are accurate, comparable, consistent and complete	Not an issue
		The ERT noted the need to improve the transparency of the information provided in the NIR on estimates for all categories, as elaborated through specific recommendations on individual sectors, in the next annual inventory submission. In this context, the ERT further notes the usefulness of providing detailed information on the choice of AD, EFs, parameters and methodologies at a more detailed level (corresponding to the CRF tables) as a way to improve transparency	
Energy			
E.13	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O	The ERT noted that the information provided in the NIR on EUROCONTROL data used for estimating emissions from domestic aviation is not transparent and thus does not allow the ERT to assess the quality of the data. During the review, Hungary provided information that allowed the ERT to confirm the reliability of EUROCONTROL as a data source for the GHG inventory	Yes. Transparency*
		The ERT recommends that Hungary include in the NIR a description of the EUROCONTROL data, including its quality	
E.14	1.A.3.b Road transportation – all fuels – CH_4 and N_2O	Hungary has used different versions of the COPERT model to estimate non-CO_2 emissions from road transport for the period 1985–2013 and 2014. In addition, the underlying databases used for the model are not yet fully consistent for some years in the middle of the time series. During the review, Hungary informed the ERT that the entire time series has not been recalculated using the same version of the COPERT 4 model because the currently available version of the COPERT 4 model only allows for the estimation of emissions for a limited number of years at a time, thus making the calculations very labour intensive. Hungary further informed the ERT that the COPERT 5 model, which will be available later in 2016, is expected to resolve this issue because it will handle time-series calculations much better than the earlier versions	Yes. Consistency*
		The ERT recommends that Hungary recalculate the non-CO_2 emissions from road transport using the same version of the COPERT model for the entire time series, while also resolving	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		the remaining inconsistencies in the underlying databases	
E.15	Comparison with international data – all fuels – CO_2	The ERT noted that, for some years in the middle of the time series, data on additives, although reported to the IEA, have not been included in CRF table 1.A(b). During the review, Hungary provided additional information that allowed the ERT to confirm that there is no underestimation of emissions in the sectoral approach owing to this omission The ERT recommends that Hungary include the data on additives in CRF table 1.A(b) for the entire time series in the next annual inventory submission	Yes. Transparency*
E.16	1.A. Fuel combustion – sectoral approach – liquid fuels – CO_2 CH_4 and N_2O	The ERT noted that Hungary's reporting on emissions from working machinery and off-road vehicles in the CRF tables is not accurate and is not transparent in the following respects: emissions related to gasoline and biofuels blended into gasoline/diesel are not reported at all and emissions related to diesel oil are only reported for subcategories 1.A.2.g.vii (off-road vehicles and other machinery) and 1.A.4.c.ii (off-road vehicles and other machinery); the notation key "IE" should be used instead of "NO" for fuel consumption for subcategories 1.A.3.e.ii and 1.A.4.c.ii (gasoline); and subcategory 1.A.4.b.ii (mobile combustion), which is currently not visible, should be displayed in CRF table 1.A(a) (fuel combustion activities – sectoral approach) using the notation key "IE". During the review, Hungary demonstrated that all final use of energy included in its energy balance is accounted for in the inventory and reported under various other subcategories of 1.A. The ERT thus notes that this lack of transparency has not resulted in an underestimation of emissions. The ERT further noted that only a part of the non-CO_2 emissions from off-road vehicles and other machinery has been reported under this category. As off-road vehicles and other machinery is already a key category for CO_2 emissions, and as significant parts of the non-CO_2 emissions are included elsewhere, the ERT notes that it could also become a key category for non-CO_2 emissions if these emissions are correctly allocated to it. According to the 2006 IPCC Guidelines, this would then require the use of higher-tier methods rather than the current estimation methodology, which, as it is including only diesel oil, is equivalent to using only parts of the tier 1 methodology in the 2006 IPCC Guidelines The ERT recommends that Hungary: correctly estimate all emissions from all fuels used for off-road vehicles and other machinery and allocate them to the relevant categories, and use the notation key "IE" for all such categories and fuels whose emissions are included elsewhere; as a first step, apply the IPCC tier 1 methodology for gasoline, diesel and biofuels for subcategories 1.A.2.g.vii, 1.A.3.e.ii, 1.A.4.b.ii and 1.A.4.c.ii for all years, treating emissions from agriculture and forestry separately because different default EFs apply for machines using gasoline. If, as a result of the correct allocation of emissions as outlined	Yes. Accuracy*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		above, non-CO_2 emissions from off-road vehicles becomes a key category, the ERT further recommends that Hungary estimate and report these emissions by developing and implementing a higher-tier methodology, transparently describing the methodology used and any recalculations in the NIR	
IPPU			
I.9	2.A.1 Cement production – CO_2	Hungary has used the CO_2 IEF for 2005 (0.51 t/t) to extrapolate for CO_2 emissions from cement production for the years before 2005 (see I.4). The ERT notes that there was a recommendation in the previous review report for Hungary to use an average IEF based on EU ETS data for the period 2005–2013 to estimate these emissions for the years before 2005 (see I.5). Hungary explains in the NIR (p. 90) that earlier calculations have used an average country-specific IEF for the period 2005–2013 to estimate emissions before 2005 and that the information received from cement factories supports the appropriateness of application of such an IEF. However, the ERT noted that Hungary has used the IEF for 2005 for extrapolating emissions to the period before 2005 in the current submission because the IEF follows a decreasing trend from 2005 to 2013. During the review, Hungary further explained that, owing to the increased use of additives to reduce CO_2 emissions from cement production since the establishment of the EU ETS, the average IEF for the period 2005–2013 cannot accurately reflect the emissions before 2005 The ERT recommends that Hungary: use a good practice data splicing technique given in the 2006 IPCC Guidelines (e.g. the overlap technique or surrogate data), as appropriate for Hungary's national circumstances, to fill data gaps in the time series of the CO_2 IEF for the period before 2005; recalculate CO_2 emissions based on the revised CO_2 IEF for that period; and include transparent information in the NIR on the estimation methodology	Yes. Accuracy*
I.10	2.A.4 Other process uses of carbonates – CO_2	Hungary has estimated and reported CO_2 emissions from soda ash use other than in glass production under the subcategory "other uses of soda ash" (2.A.4.b) using AD on soda ash imports from the Hungarian Central Statistical Office, and United Nations Comtrade data for 1991 onwards have been used to calculate emissions for the years before 1991 by applying volume indices of total trade with import and export information. Hungary has also mentioned in the NIR (p. 99) that there is no production of soda ash in the country. However, the ERT noted that the NIR does not clarify how exports of imported soda ash have been taken into account in the calculations. During the review, Hungary informed the ERT that only a minor portion of the imported soda ash (0.0003%–0.45%) is exported, which has already been taken into account in the calculation of emissions The ERT recommends that Hungary provide information on exports of soda ash and an	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		explanation of how it has been taken into account in the calculations to estimate emissions	
I.11	2.C.6 Zinc production – CO_2	Hungary has reported CO_2 emissions from zinc production in the CRF tables for the IPPU sector using the notation key "IE", with the explanation that these emissions have been included in emissions from fuel combustion in non-ferrous metals production (1.A.2.b) under the energy sector. The NIR does not provide transparent information on the nature of zinc production activities in the country. During the review, Hungary informed the ERT that, since 1985, there has been only zinc reprocessing in Hungary, which causes only emissions from fuel use that are reported under the energy sector, and there are no process-related emissions associated with zinc reprocessing. However, the ERT noted that only process-related CO_2 emissions from zinc production are to be reported under the IPPU sector and thus the appropriate notation key to be used for subcategory 2.C.6 is "NO"	Yes. Transparency*
		The ERT recommends that Hungary use the appropriate notation key "NO" instead of "IE" for zinc production in the CRF table for the IPPU sector (2(I).A-Hs2) and clarify the nature of zinc production (i.e. primary or secondary) in the NIR	
I.12	2.F.1 Refrigeration and air conditioning – HFCs and PFCs	Hungary has estimated emissions of F-gases from refrigeration and air conditioning using data on annual sales and amount destroyed for products or equipment containing F-gases. The NIR, however, mentions that data for 2014 have not been available because of major restructuring of the institutes that handle the database; therefore, extrapolated data using annual sales data from the Hungarian Central Statistical Office were used. During the review, Hungary informed the ERT that the emissions for 2014 will be recalculated by replacing the extrapolated data with actual data in the next submission	Yes. Accuracy*
		The ERT recommends that Hungary recalculate the F-gas emissions from refrigeration and air conditioning by replacing the extrapolated HFC and PFC activity data for 2014 with actual data	
Agriculture			
A.6	3.B.1 Cattle – CH_4	The ERT noted that the MCF used for solid storage and dry lot manure management systems for non-dairy cattle is mentioned as 2% in the NIR (table 5.3.15), whereas it is given as 1% in CRF table 3B(a)s2. During the review, Hungary informed the ERT that the MCF value in the NIR is the correct one	Yes. Transparency*
		The ERT recommends that Hungary report the correct value for the MCF for solid storage and dry lot manure management systems for non-dairy cattle in CRF table 3.B(a)s2	
A.7	3.C.1 Irrigated rice	The ERT noted that the NIR does not include transparent information on the values of	Yes.

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem?[b] If yes, classify by type
	cultivation – CH_4	parameters used for calculating the EFs for irrigated rice cultivation based on equation 5.2 of the 2006 IPCC Guidelines: baseline emission factor (EF_c), scaling factor for water regime (SF_w), scaling factor for water regime in the pre-season (SF_p), scaling factor for organic amendment (SF_o), conversion factor for organic amendment (CFOAi) and application rate of organic amendment (ROA_i). During the review, Hungary provided the ERT with the values of these parameters The ERT recommends that Hungary include the values of parameters used for calculating the EFs for irrigated rice cultivation in the NIR	Transparency*
A.8	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O	The ERT noted that the term for annual amount of N in crop residues (F_{CR}) was not included in the equation used for calculating indirect N_2O emissions due to leaching and run-off in the NIR (equation 5.3, p. 207). During the review, the Party acknowledged that this was due to a typographical error and confirmed that it did not affect the actual emission estimates The ERT recommends that Hungary correct the typographical error in equation 5.3 of the NIR to include the term for F_{CR}	Yes. Transparency*
A.9	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O	The ERT noted that the values reported in CRF table 3.D and NIR table 5.5.1 are not fully consistent. For example, the values reported for direct N_2O emissions from application of inorganic N fertilizers to managed soils (3.D.a.1) for 1990 in CRF table 3.D and NIR table 5.5.1 are 5.63 Gg N_2O and 2.20 Gg N_2O, respectively. During the review, Hungary acknowledged that the value reported in NIR table 5.5.1 was incorrect and provided the ERT with the correct version of table 5.5.1 The ERT recommends that Hungary include the correct version of NIR table 5.5.1 that is consistent with CRF table 3.D	Yes. Transparency*
A.10	3.D.a Direct N_2O emissions from managed soils – N_2O	The ERT noted that some values in the time series of N losses from applied organic N fertilizer materials and from grazing reported in the NIR (table 5.5.5, p. 206) are incorrect. For example, the value for 2014 is reported as 33.75 kt N instead of the correct value of 14.3 kt N. During the review, Hungary acknowledged that the values reported in the NIR are incorrect and provided the correct values to the ERT. The ERT notes that this discrepancy has no effect on the reported emissions The ERT recommends that Hungary include the correct version of table 5.5.5 in the NIR	Yes. Transparency*
A.11	3.D.a.2 Organic N fertilizers – N_2O	Hungary reported the emissions from the subcategory other organic fertilizers applied to soils (3.D.a.2.c) as "NO" throughout the entire time series in CRF table 3.D. However, the NIR (p. 201) states that use of compost and other organic amendments has not been estimated because of a lack of information and therefore these emissions have been reported as "NE" in CRF	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		table 3.D. The ERT notes that, as mentioned in the NIR, according to the 2006 IPCC Guidelines, other organic N additions can be included in the calculation if sufficient information is available. During the review, Hungary acknowledged that the use of the notation key "NO" for emissions from this subcategory in CRF table 3.D is incorrect The ERT recommends that Hungary use the correct notation key "NE" in CRF table 3.D for emissions from the subcategory other organic fertilizers applied to soils (3.D.a.2.c)	
A.12	3.D.a.6 Cultivation of organic soils (i.e. histosols) – N_2O	Noting that Hungary has reported N_2O emissions from cultivation of histosols using the notation key "NO" in CRF table 4.D for the entire time series, the 2014 annual review report (para. 51) provided a recommendation that the Party include the outcome of communications with FAOSTAT, the database of FAO, on cultivation of histosols in the NIR (see A.5). In the NIR, as well as during the review, Hungary provided an explanation regarding the improvement in the information on cultivation of histosols in the 2016 submission compared with the 2014 submission. Following the recommendation, Hungary communicated with FAO and EC-JRC, which provided soil data for Hungary to the FAO. However, this communication did not result in a satisfactory improvement in the data because the Party could not provide spatial data on organic soils to EC-JRC, owing to a lack of reliable data. The communication between Hungary and EC-JRC further revealed that there are accuracy problems in delineating the existing soil data of EC-JRC. Although the ERT accepted the Party's reporting for the 2016 submission, the ERT believes that this issue should be considered further in future reviews to confirm there is no underestimation of emissions The ERT commends the Party for its effort. However, in order to enhance transparency, the ERT recommends that Hungary provide a robust rationale to demonstrate that the area of cultivated organic soil in Hungary is zero and/or explore ways to resolve this issue with FAO and EC-JRC	Yes. Transparency*
A.13	3.D.b.1 Atmospheric deposition – N_2O	The ERT noted that, for estimating indirect N_2O emissions from managed soils, Hungary has used lower values than IPCC default values for the fraction of synthetic fertilizer N that volatilizes as NH_3 and NO_x ($Frac_{GASF}$ of 0.07 compared to the IPCC default value of 0.10) and fraction of applied organic N fertilizer materials ($Frac_{GASM}$ of 0.12 compared to the IPCC default value of 0. 20). These parameters were calculated from parameters described in the EMEP and EEA *Air Pollutant Emission Inventory Guidebook*. However, the NIR does not describe the detailed calculation method (e.g. values of parameters and EFs) used. During the review, Hungary provided to the ERT the calculation method, including the parameters used The ERT recommends that Hungary provide, in the NIR, more detailed information on the EMEP/EEA estimation methodology used to derive $Frac_{GASF}$ and $Frac_{GASM}$, including the	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		parameters and equation used	
A.14	3.D.b.2 Nitrogen leaching and run-off – N_2O	The ERT noted that Hungary has recalculated the area subject to N leaching and run-off in the 2016 submission. As explained in the NIR, the recalculation has been conducted owing to the significant changes made within the subcategory nitrogen leaching and run-off (3.D.b.2) because of the revision of irrigated areas and humid regions, where leaching/run-off occurs (i.e. where $Frac_{LEACH-H}$ is non-zero) as a consequence of findings of the trial EU ESD review in 2015. The recalculation led to a significant increase in the amount of N leached annually, and the subsequent N_2O emissions. Hungary used a model to classify land areas into those subject to leaching (leaching areas) and where no leaching takes place (non-leaching areas). However, the ERT noted that the NIR did not provide information on the QA/QC process or any verification of the model output data on dry area/non-leaching area. During the review, Hungary provided this information to the ERT	Yes. Transparency*
		The ERT recommends that Hungary include the QA/QC process and verification information for the model used to classify areas into leaching and non-leaching areas (e.g. scientific papers or measurement data, comparison with other countries, comparison with other estimates such as those based on soil type and/or crop type) in the NIR	
A.15	3.G Liming – CO_2	The ERT noted that Hungary has used different sources for AD for estimating the CO_2 emissions from liming for different parts of the time series, namely, 1999–2006, 2007–2009 and 2010 onwards. In addition, the Party filled the gap in the AD for the period 1985–1999 by using a country-specific method. However, the NIR did not include information on this country-specific methodology and did not explain how the Party addressed the time-series consistency issues arising from the use of different data sources. During the review, Hungary provided to the ERT the detailed calculation method for deriving the missing data for the period 1985–1999, which involved the use of reclaimed areas as proxy data. In addition, the Party also explained that the reason for using different data sources for 2007–2009 was that more accurate data were available for 2007–2009	Yes. Consistency*
		The ERT recommends that Hungary provide in the NIR detailed information on: the different sources of AD used in the time series; the country-specific calculation methods used for deriving the missing AD for the period 1985–1999; and how the Party addressed the time-series consistency issues arising from the use of different sources of AD through the time series	
LULUCF			
L.10	4. General (LULUCF) –	The NIR contains several graphs illustrating AD and estimated emissions/removals for the period after 2005. However, these graphs do not contain data for the period before 2005.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
	CO_2, N_2O and NH_4	During the review, the Party explained that the reason for not showing data for the whole time series is because land-use data are available only from 1985. In addition, as opposed to the data from 2005 onwards, the time-series data for the period before 2005 will likely have artefacts because these involve areas under various land-use categories that have accumulated over less than the 20-year transition period. The ERT noted that the transparency would be significantly enhanced if information on AD and emissions/removals is displayed for the full mandatory reporting period, consistent with the reporting in the CRF tables The ERT recommends that Hungary include graphs containing AD and data on emissions/removals for the whole inventory time series in the NIR, distinguishing (where relevant) the period before 2005 graphically and/or by providing suitable explanation in the NIR text and figure legends	
L.11	4.A.2 Land converted to forest land – CO_2	The ERT noted that Hungary has reported the carbon stock changes in dead wood and litter pools in cropland converted to forest land, grassland converted to forest land and settlements converted to forest land as "NO", "IE" and NE", respectively. The NIR provides the explanation that, as the current sampling is not intensive enough to develop statistically valid estimates of emissions/removals from deadwood and litter, the Party has made a conservative assumption of zero carbon stock change in these pools. However, the ERT noted that, in order to enhance the completeness of reporting, as a first step, the Party could develop tier 1 estimates for the carbon stock changes in the litter pool in cropland converted to forest land, grassland converted to forest land and settlements converted to forest land using the default values for carbon stocks in litter for forest land, cropland, grassland and settlements provided in the 2006 IPCC Guidelines The ERT recommends that the Party develop tier 1 estimates of changes in the carbon stocks in litter pool in cropland converted to forest land, grassland converted to forest land and settlements converted to forest land using the default values of litter stocks provided in the 2006 IPCC Guidelines and report these in the NIR. The ERT further encourages the Party to collect country-specific data on carbon stocks in dead wood and litter pools to estimate carbon stock changes in these pools in the above-mentioned categories using the tier 2 methodology in the 2006 IPCC Guidelines	Yes. Completeness
Waste			
W.4	5.A Solid waste disposal on land – CH_4	The ERT noted that NIR table 7.1.1 on generation and treatment of municipal solid waste does not include data for 2007. In response to a question raised by the ERT, the Party provided the data for 2007. Hungary also provided an explanation that this table only serves to show the	Not an issue

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem?[b] If yes, classify by type
		recent changes in the generation and treatment of solid waste, and, owing to space limitations, the column for 2007 data was arbitrarily chosen to be excluded. Hungary further informed the ERT that it will consider revising the structure of the table so as to accommodate all the columns	
		The ERT encourages Hungary to include the data for 2007 in NIR table 7.1.1, if necessary by revising the structure of table so as to accommodate columns for all the years in the time series	
W.5	5.A.1 Managed waste disposal sites – CH_4	Hungary has estimated the amount of CH_4 recovery for energy by collecting data on biogas from landfills and composting sites, and using the conversion factor 50.4 TJ/Gg, which implies a well-managed CH_4 recovery system. However, the Party reported the amount of flared CH_4 as "NE". The ERT noted that, in a well-managed CH_4 recovery system, if the CH_4 concentration is too high to be used for energy generation, it is likely flared for safety reasons and therefore it is reasonable to expect some amount of flared CH_4 in such systems. The ERT further noted that the NIR did not include the amount of biogas recovered from landfills used to calculate the CH_4 recovered for energy. During the review, the Party informed the ERT that it is currently working on collecting data to determine the amount of CH_4 flared, which is among the planned improvements for the inventory. The ERT noted that according to the 2006 IPCC Guidelines, it is consistent with good practice to report CH_4 recovery only when references documenting the amount of CH_4 recovery are available	Yes. Transparency*
		The ERT recommends that Hungary add information on biogas production (e.g. by adding a column in table 7.2.4) in the NIR. The ERT further encourages Hungary to determine the amount of CH_4 flaring in solid waste disposal in landfills (e.g. by carrying out a site survey)	
W.6	5.C.1 Waste incineration – CH_4 and N_2O	The ERT noted that the NIR does not include a sufficiently transparent description of the derivation of carbon content for the incinerated waste and the non-CO_2 EF used for the calculation of emissions. The NIR states that the carbon content, as well as fossil and (negligible) biogenic fractions, of the incinerated waste could be determined using the default values from tables 2.5 and 2.6 in the 2006 IPCC Guidelines. During the review, Hungary provided detailed information on the derivation of the non-CO_2 EF and the carbon content of incinerated waste used for calculating emissions for waste incineration	Yes. Transparency*
		The ERT recommends that Hungary provide detailed and transparent information on the derivation of the carbon content and the non-CO_2 EF for waste incineration	
W.7	5.D Wastewater treatment and discharge –	Hungary has calculated the amount of CH_4 recovery from biogas production for the entire time series. However, the NIR does not provide any information on the amount of flared CH_4 or the amount of biogas production used in the calculations. During the review, the Party provided the	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
	CH_4	explanation that it has no information on flaring of CH_4 in wastewater treatment and discharge facilities in Hungary. Hungary also provided the ERT with information on the amount of biogas production	
		The ERT recommends that Hungary improve the transparency of the description of the calculation for CH_4 recovery in the NIR by including an explanation on the amount of CH_4 flared and by adding a new column for CH_4 recovery from biogas production	
W.8	5.D.1 Domestic wastewater – N_2O	The ERT noted that the values reported in NIR table 7.5.4 and CRF table 5.D are not fully consistent. The values for N_2O emissions from domestic wastewater in 2014 as reported in NIR table 7.5.4 and CRF table 5.D are 0.02 Gg and 0.75 Gg, respectively. In addition, NIR table 7.5.4 reports 92.95 Gg N_2O as emissions from effluent, but in CRF table 5.D, this value (given in kt N/year) is mentioned as the N from effluent instead. During the review, Hungary acknowledged the errors in NIR table 7.5.4, and confirmed that the values reported in CRF table 5.D are correct. Hungary also provided a corrected version of NIR table 7.5.4 to the ERT	Yes. Transparency*
		The ERT recommends that Hungary provide correct values of N_2O emissions from domestic wastewater in table 7.5.4 in the NIR, consistent with the values reported in CRF table 5.D	
W.9	5.D.1 Domestic wastewater – CH_4	The ERT noted that NIR table 7.5.3 (domestic and industrial wastewater treatment) did not include the share of untreated domestic wastewater. During the review, Hungary provided the explanation that the percentages reported in the table are related to total collected wastewater and not to total treated wastewater	Yes. Transparency*
		The ERT recommends that Hungary include the share (per cent) of untreated wastewater in table 7.5.3 of the NIR	
KP-LULUCF			
KL.1	General (KP-LULUCF) – CO_2, N_2O and CH_4	The ERT noted that in the CRF table "accounting", the value for the accounting quantity for forest management has been reported as 30 697.98 kt CO_2 eq instead of –2 636.14 kt CO_2 eq. During the review, the Party provided the clarification that (as confirmed by the secretariat during the review) the accounting quantity for forest management was incorrectly reported owing to technical issues with the CRF Reporter software. The ERT notes that the Party intends to resubmit the CRF table for accounting with the correct value for the above-mentioned parameter after the issues in the CRF Reporter software are addressed	Not a problem
KL.2	Afforestation and reforestation – CO_2	Hungary has reported the carbon stock changes in dead wood, litter and mineral soil pools in afforestation and reforestation as "NE". The NIR (pp. 353–361) provides the information demonstrating that these carbon pools are not a source	Not a problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem?[b] If yes, classify by type*
		The ERT encourages the Party to estimate and report the emissions/removals from the dead wood, litter and soil carbon pools in afforestation and reforestation by developing data on carbon stocks in these pools and applying the higher-tier methods provided in the 2006 IPCC Guidelines	
KL.3	Forest management – CO_2	Hungary has reported the carbon stock changes in dead wood, litter and mineral soil pools in forest management as "NE". The NIR (pp. 353–361) provides the information demonstrating that these carbon pools are not a source	Not a problem
		The ERT encourages the Party to estimate and report the emissions/removals from the dead wood, litter and soil carbon pools in forest management by developing data on carbon stocks in these pools and applying the higher-tier methods provided in the 2006 IPCC Guidelines	
KL.4	N_2O emissions from N mineralization/ immobilization due to carbon loss/gain associated with land-use conversions and management change in mineral soils – N_2O	The ERT noted that Hungary reported different areas under the deforestation activity for 2014 in CRF tables 4(KP-I)A.2 and 4(KP-II)3 (11.27 kha and 1.90 kha, respectively). During the review, the Party acknowledged that the area reported in CRF table 4(KP-II)3 was incorrect and provided the ERT with the correct values for the area under deforestation and the N_2O emissions. The ERT noted that the difference in the reported and correct amounts of N_2O emission is insignificant (approximately 0.5 kt CO_2 eq)	Yes. Accuracy*
		The ERT recommends that Hungary provide the correct values for the area under deforestation activity and N_2O emissions in CRF table 4(KP-II)3. The ERT also recommends that Hungary introduce a QA/QC procedure to check that areas are reported consistently across CRF tables to avoid such issues in the future	

Abbreviations: AD = activity data, CRF = common reporting format, EC-JRC = European Commission Joint Research Centre, EEA = European Environment Agency, EF = emission factor, EMEP = European Monitoring and Evaluation Programme, ERT = expert review team, EU ESD = European Union effort-sharing decision, EU ETS = European Union Emissions Trading System, FAO = Food and Agriculture Organization of the United Nations, FAOSTAT = Food and Agriculture Organization of the United Nations Statistics Division, F-gas = fluorinated gas, GHG = greenhouse gas, IE = included elsewhere, IEA = International Energy Agency, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MCF = methane conversion factor, N = nitrogen, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] Recommendations are related to issues as defined in decision 13/CP.20, annex, paragraph 81, or problems as identified in decision 22/CMP.1, annex, paragraph 69, identified by the ERT during the review. Encouragements are made to the Party to address all findings not related to such issues.

[b] An asterisk is included next to each issue type that is also a problem, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2016 annual submission of Hungary.

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

12. Annex I shows the accounting quantities for KP-LULUCF as reported by the Party and the final values after the review. The final quantity of units to be issued are presented in the same annex.

VIII. Questions of implementation

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

Annex I

Overview of greenhouse gas emissions and removals for Hungary for submission year 2016 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

1. Tables 6–9 provide an overview of total greenhouse gas emissions and removals as submitted by the Party.

Table 6
Total greenhouse gas emissions for Hungary, base year[a]–2014[b]
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7 bis as contained in the Doha amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*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								–1 000.00
Base year	107 854.22	109 574.82	107 854.22	109 574.82	NA		NA	
1990	91 701.19	94 133.97	91 701.19	94 133.97				
1995	70 359.52	75 705.78	70 359.52	75 705.78				
2000	73 341.45	73 556.69	73 341.45	73 556.69				
2010	61 813.32	65 523.69	61 813.32	65 523.69				
2011	60 476.03	63 808.01	60 476.03	63 808.01				
2012	56 031.97	60 106.90	56 031.97	60 106.90				
2013	54 455.65	57 553.83	54 455.65	57 553.83		–1 113.77	NA	–1 534.90
2014	52 631.56	57 225.16	52 631.56	57 225.16		–924.10	NA	–3 181.24

Abbreviations: CM = cropland management, FM = forest management, FMRL = forest management reference level, GHG = greenhouse gas, GM = grazing land management, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable, RV = revegetation, WDR = wetland drainage and rewetting.

[a] Base year refers to the base year under the Kyoto Protocol, which is the average of the period 1985–1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs, SF_6 and NF_3. Hungary has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol.

[b] Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[c] The Party has not reported indirect CO_2 emissions in common reporting format table 6.

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

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

Table 7
Greenhouse gas emissions by gas for Hungary, excluding land use, land-use change and forestry, 'average of years 1985–1987'–2014[a]
(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
Average of years 1985–1987	85 194.10	12 660.41	11 403.89	NO	371.08	NO	6.15	NO
1990	73 115.20	11 967.24	8 664.92	NO	375.72	NO	10.89	NO
1995	61 354.46	9 034.23	5 000.68	41.65	222.72	NO	52.04	NO
2000	58 336.81	8 957.82	5 621.47	273.44	283.11	NO	84.04	NO
2010	52 108.89	8 036.88	4 054.66	1 223.01	1.52	NO	98.72	NO
2011	50 272.87	7 821.17	4 259.61	1 345.29	2.16	NO	106.92	NO
2012	46 774.94	7 824.92	4 200.48	1 184.63	1.72	NO	120.20	NO
2013	43 930.88	7 618.50	4 599.50	1 280.34	1.69	NO	122.92	NO
2014	43 573.41	7 613.97	4 503.56	1 428.16	1.96	NO	104.10	NO
Per cent change 'Average of years 1985–1987'–2014	**–48.9**	**–39.9**	**–60.5**	**NA**	**–99.5**	**NA**	**1 593.6**	**NA**

Abbreviations: NA = not applicable, NO = not occurring.
[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.
[b] Hungary did not report indirect CO_2 emissions in common reporting format table 6.

Table 8
Greenhouse gas emissions by sector for Hungary, 'average of years 1985–1987'–2014[a, b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
Average of years 1985–1987	78 826.14	15 075.96	12 051.25	–1 720.60	3 682.29	NO
1990	68 087.82	11 711.90	10 107.80	–2 432.78	4 226.45	NO
1995	57 017.42	8 270.86	5 967.64	–5 346.26	4 449.85	NO
2000	54 432.22	8 270.01	6 164.69	–215.25	4 689.77	NO
2010	48 643.94	6 562.63	5 684.57	–3 710.37	4 632.54	NO
2011	46 668.82	6 698.84	5 924.87	–3 331.98	4 515.48	NO
2012	43 360.46	6 237.64	5 960.94	–4 074.93	4 547.86	NO
2013	41 076.68	5 721.74	6 385.99	–3 098.18	4 369.42	NO
2014	40 279.59	6 128.69	6 533.12	–4 593.59	4 283.75	NO
Per cent change 'Average of years 1985–1987'–2014	**–48.9**	**–59.3**	**–45.8**	**167.0**	**16.3**	**NA**

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.

[b] Hungary did not report indirect CO_2 emissions in common reporting format 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]–2014, for Hungary

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				–1 000.00				
Technical correction				–40.00				
Base year	NA				NA	NA	NA	NA
2013		–1 233.03	119.26	–1 534.90	NA	NA	NA	NA
2014		–1 069.10	145.00	–3 181.24	NA	NA	NA	NA
Per cent change base year–2014					**NA**	**NA**	**NA**	**NA**

Abbreviations: FMRL = forest management reference level, NA = not applicable.

[a] Base year refers to the base year under the Kyoto Protocol, which is the average of the period 1985–1987 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs, SF_6 and NF_3. Hungary has not elected any activities under Article 3, paragraph 4 of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

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

2. Table 10 provides information on the accounting quantities for reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as reported by the Party, and the final values after the review.

Table 10
Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol, for Hungary
(t CO_2 eq)

Greenhouse gas source and sink activities	*Base year*[a]	*Net emissions/removals*			*Accounting parameters*	*Accounting quantity*[c]
		2013	*2014*	*Total*[b]		
		kt CO_2 eq				
A.1. Afforestation/reforestation		–1 233.030	–1 069.101	–2 302.130		–2 302.130
Excluded emissions from natural disturbances[d]		NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA		NA
A.2. Deforestation		119.265	144.996	264.261		264.261
B.1. Forest management				–4 716.140		–2 636.140
Net emissions/removals		–1 534.903	–3 181.237	–4 716.140		
Excluded emissions from natural disturbances[d]		NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA		NA
Any debits from CEF-ne		NO	NO	NO		NO
FMRL[e]					–1 000.000	
Technical corrections to FMRL					–40.00	
Forest management cap					30 697.978	–2 636.140
B.2. Cropland management (if elected)	NA	NA	NA	NA		NA
B.3. Grazing land management (if	NA	NA	NA	NA		NA

Greenhouse gas source and sink activities	*Base year*[a]	*Net emissions/removals*			*Accounting parameters*	*Accounting quantity*[c]
		2013	*2014*	*Total*[b]		
		kt CO_2 eq				
elected)						
B.4. Revegetation (if elected)	NA	NA	NA	NA		NA
B.5. Wetland drainage and rewetting (if elected)	NA	NA	NA	NA		NA

Abbreviations: CEF-ne = newly established forest, FMRL = forest management reference level, NA = not applicable, NO = not occurring.

[a] Net emissions and removals from cropland management, grazing land management, revegetation and/or wetland drainage and rewetting, if elected, in the Party's base year, as established by decision 9/CP.2.

[b] Cumulative net emissions and removals for all years of the commitment period reported in the current submission.

[c] The accounting quantity is the total quantity of units to be added to or subtracted from a Party's assigned amount for a particular activity in accordance with the provisions of Article 7, paragraph 4, of the Kyoto Protocol.

[d] The Party has indicated it does not intend to exclude emissions from natural disturbances.

[e] FMRL as inscribed in the appendix of the annex to decision 2/CMP.7, in kt CO_2 eq per year.

3. Table 11 provides an overview of relevant key data for Hungary's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 11
Key relevant data for Hungary under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: annual accounting
	(b) Deforestation: annual accounting
	(c) Forest management: annual accounting
	(d) Cropland management: not elected
	(e) Grazing land management: not elected
	(f) Revegetation: not elected
	(g) Wetland drainage and rewetting: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	No
3.5% of total base-period GHG emissions, excluding LULUCF and including indirect CO_2 emissions	3 835.118 kt CO_2 eq (30 680.949 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. Afforestation and reforestation in 2014	Issue 1 069 100 RMUs
2. Deforestation in 2014	Cancel 144 996 units
3. Forest management in 2014	Issue 1 101 237 RMUs
4. Cropland management in 2014	NA
5. Grazing land management in 2014	NA
6. Revegetation in 2014	NA
7. Wetland drainage and rewetting in 2014	NA

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction unit, ERU = emission reduction unit, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, RMU = removal unit.

Annex II

Information to be included in the compilation and accounting database

Tables 12 and 13 include the information to be included in the compilation and accounting database for Hungary. 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 12
Information to be included in the compilation and accounting database for 2014, including the commitment period reserve, for Hungary
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	391 037 652			391 037 652
Annex A emissions for 2014				
CO_2	43 573 409			43 573 409
CH_4	7 613 969			7 613 969
N_2O	4 503 560			4 503 560
HFCs	1 428 160			1 428 160
PFCs	1 961			1 961
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	104 097			104 097
NF_3	NO			NO
Total Annex A sources	**57 225 156**			**57 225 156**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 Afforestation and reforestation	–1 069 101			–1 069 101
3.3 Deforestation	144 996			144 996
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 Forest management	–3 181 237			–3 181 237

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

Table 13
Information to be included in the compilation and accounting database for 2013, for Hungary
($t CO_2 eq$)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2013				
CO_2	43 930 878			43 930 878
CH_4	7 618 500			7 618 500
N_2O	4 599 499			4 599 499
HFCs	1 280 341			1 280 341
PFCs	1 691			1 691
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	122 924			122 924
NF_3	NO			NO
Total Annex A sources	**57 553 833**			**57 553 833**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–1 233 030			–1 233 030
3.3 Deforestation	119 265			119 265
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management	–1 534 903			–1 534 903

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

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 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories* were reported as "NE" (not estimated) or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

Carbon stock changes in the litter pool in cropland converted to forest land, grassland converted to forest land and settlements converted to forest land (L.11).

Annex IV

Documents and information used during the review

A. Reference documents

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 <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

Annual status report for Hungary for 2016.Available at <http://unfccc.int/resource/docs/2016/asr/HUN.pdf>.

FCCC/ARR/2014/HUN. Report on the individual review of the annual submission of Hungary submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/HUN.pdf>.

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

FCCC/ARR/2012/HUN. Report on the individual review of the annual submission of Hungary submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/HUN.pdf>.

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

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

"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". Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=4>.

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

"Guidelines for 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". Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf#page=6>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, Part I: Implications related to accounting and reporting and other related issues". Decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=5>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, Part II: Implications related to review

and adjustments and other related issues". Decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=30>.

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

Intergovernmental Panel on Climate Change. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Available at <http://www.ipcc-nggip.iges.or.jp/public/kpsg>.

Intergovernmental Panel on Climate Change. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. Available at <http://www.ipcc-nggip.iges.or.jp/public/wetlands/index.html>.

Standard independent assessment report, part 1, for Hungary for 2016. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

Standard independent assessment report, part 2, for Hungary for 2016. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Huszár (Department for Climate Policy), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Hungary:

European Soil Data Centre, Land Resource Management Unit, Joint Research Centre, Institute for Environment and Sustainability, European Commission. 2014. *Spatial soil information for Hungary.*

[1] Reproduced as received from the Party.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
BOD	biochemical oxygen demand
CEF-ne	newly established forest
CER	certified emission reduction
CH_4	methane
CM	cropland management
COD	chemical oxygen demand
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CP2	second commitment period
CRF	common reporting format
EC-JRC	European Commission Joint Research Centre
EEA	European Environment Agency
EF	emission factor
EMEP	European Monitoring and Evaluation Programme
ERT	expert review team
ERU	emission reduction factor
EU	European Union
EU ESD	European Union effort-sharing decision
EU ETS	European Union Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization of the United Nations Statistics Division
F-gas	fluorinated gas
FM	forest management
FMRL	forest management reference level
Gg	gigagram
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
kha	kilohectare
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne
LULUCF	land use, land-use change and forestry
MCF	methane conversion factor
N	nitrogen
NA	not applicable
NE	not estimated
NF_3	nitrogen trifluoride
NH_3	ammonia

NIR	national inventory report
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	sulphur hexafluoride
SIAR	standard independent assessment report
t	tonne
TJ	terajoule
UNFCCC	United Nations Framework Convention on Climate Change
WDR	wetland drainage and rewetting