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

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas inventory covering emissions and removals of greenhouse gas emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2018 annual submission of Slovenia, 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 24 to 29 September 2018 in Bonn.

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

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Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex A sources	source categories included in Annex A to the Kyoto Protocol
ARR	annual review report
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
AWMS	animal waste management system
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COD	chemical oxygen demand
CP	commitment period
CPR	commitment period reserve
CRF	common reporting format
DOM	dead organic matter
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU	European Union
F-gas	fluorinated gas
FM	forest management
FMRL	forest management reference level
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MMS	manure management system
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NE	not estimated
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring

PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulfur hexafluoride
SORS	Statistical Office of the Republic of Slovenia
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2018 annual submission of Slovenia organized by the secretariat in accordance with the Article 8 review guidelines (adopted by decision 22/CMP.1 and revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 24 to 29 September 2018 in Bonn and was coordinated by Ms. Lisa Hanle (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Slovenia.

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

Area of expertise	*Name*	*Party*
Generalist	Ms. Daniela Romano	Italy
	Mr. Marius Ţăranu	Republic of Moldova
Energy	Ms. Ana Carolina Avzaradel Szklo	Brazil
	Mr. Hiroshi Ito	Japan
	Ms. Kristine Tracey	Canada
	Mr. Shengmin Yu	China
IPPU	Ms. Niculina Mihaela Bălănescu	Romania
	Mr. Jacek Skoskiewicz	Poland
Agriculture	Mr. Jacques Kouazounde	Benin
	Mr. Nidup Peljor	Bhutan
	Mr. Asaye Ketema Sekie	Ethiopia
LULUCF	Mr. Johannes Brötz	Germany
	Ms. Thelma Krug	Brazil
	Ms. Valentyna Slivinska	Ukraine
Waste	Mr. Jose Manuel Ramirez Garcia	Spain
	Mr. Hiroyuki Ueda	Japan
Lead reviewers	Ms. Romano	
	Mr. Yu	

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

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

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

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

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

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

II. Summary and general assessment of the 2018 annual submission

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

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

Assessment				*Issue or problem ID#(s) in table 3 and/or 5[a]*
Dates of submission	Original submission: 13 April 2018 (NIR), 13 April 2018, version 4 (CRF tables), 12 April 2018 (SEF-CP2-2017 tables)			
	Revised submission: 28 September 2018, versions 6 and 7 (CRF tables)			
Review format	Centralized			
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:			
		(a) Identification of key categories	Yes	G.3
		(b) Selection and use of methodologies and assumptions	Yes	E.18, I.12, I.16, L.12, W.11, KL.10, KL.11
		(c) Development and selection of EFs	Yes	E.4, E.7, I.9, A.3, L.8, L.32, L.33
		(d) Collection and selection of AD	Yes	A.7, L.3
		(e) Reporting of recalculations	No	
		(f) Reporting of a consistent time series	Yes	E.15, I.2, A.9, L.4, W.2, W.3
		(g) Reporting of uncertainties, including methodologies	Yes	L.2, W.10

[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.

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	E.16, I.14, I.15, I.17 L.9, L.10, L.24, W.14
	(j) Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, in conjunction with decision 3/CMP.11, taking into consideration any findings or recommendations contained in the standard independent assessment report?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, in conjunction with decision 3/CMP.11, including any changes since the previous annual submission?	Yes	G.4
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.1
	(b) Demonstration of methodological consistency between the reference level and reporting on	No	

Assessment			*Issue or problem ID#(s) in table 3 and/or 5*[a]
	FM in accordance with decision 2/CMP.7, annex, paragraph 14		
	(c) Reporting requirements of decision 6/CMP.9	Yes	KL.15
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	Yes	KL.4
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	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Slovenia does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Questions of implementation	Did the ERT list any questions of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors and for KP-LULUCF activities that are not listed in this table but are included in table 3 and/or 5.

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

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

8. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 22 August 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2018 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

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

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

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
		There were no general recommendations included in the 2016 ARR.	
Energy			
E.1	Fuel combustion – reference approach – all fuels – CO_2 (E.1, 2016) (E.1, 2015) (24, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Make all possible efforts to provide more information in the national energy balance tables (including data on losses and statistical differences) and provide comparisons of these data and emission estimates in the NIR, as a verification procedure.	Resolved. During the review, the Party explained that losses and statistical differences are included under the category commercial/institutional in the national energy balance, as this economic sector is determined by fuel balance differences in the national statistics. Real values on losses and statistical differences are not available or are nominally zero in the national energy balance tables. In its NIR (section 3.3.2.4, p.114), the Party also reported its verification procedure for fugitive emissions from natural gas systems and provided relevant results.
E.2	Fuel combustion – reference approach – all fuels – CO_2 (E.2, 2016) (E.2, 2015) (25, 2014) (25, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure the consistency of information provided in the CRF tables and the NIR, and enhance QC procedures to ensure that such inconsistencies and errors do not occur (information provided on lubricants in annex 4, table 3, for 2004 and 2005 was not in line with the information on lubricants provided in table 3.1.10 of the NIR and in CRF table 1.A(d)).	Resolved. Consistent information was provided between the CRF tables and annex 4 to the NIR, which contains information on the 2016 national energy balance. Information on lubricants presented in the main text of the NIR (table 3.2.11), in annex 4 to the NIR (table A4.1) and in the CRF tables is consistent.
E.3	International bunkers and multilateral operations – liquid fuels – CO_2 (E.5, 2016) (E.5, 2015) (27, 2014) Consistency	Ensure the consistency of the reporting and improve the implementation of QC procedures in order to prevent such errors in subsequent annual submissions (emissions reported in NIR table 3.1.5 were different from the emissions reported in CRF table 1.C for the years 2005–2012).	Resolved. Consumption of residual fuel oil and emission estimates reported in table 3.2.5 (formerly table 3.1.5 in the 2014 annual submission) of the NIR are consistent with the corresponding data in CRF table 1.D (formerly CRF table 1.C) for international navigation for 2005 onwards, suggesting that QC procedures have been improved.
E.4	1.A Fuel combustion – sectoral approach – liquid fuels – CO_2 (E.8, 2016) (E.8, 2015) (31, 2014) (29, 2013) (45, 2012) (35, 2011) (33, 2010) Accuracy	Develop country-specific CO_2 EFs for all fuels that have a significant share in the fuel mix for each category.	Not resolved. The Party explained that it is undertaking a process to resolve this issue together with the EU, because this issue is part of an EU capacity-building project.
E.5	1.A Fuel combustion – sectoral approach – liquid fuels – CO_2 (E.15, 2016)	Include in the submission the results of discussions with SORS regarding the use of constant	Addressing. The NIR (table 10.2.1, p.333) indicates that the Slovenian Environment Agency has notified SORS of this problem by mail and again at a meeting with SORS held on

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(E.15, 2015) Transparency	NCVs for liquid fuels for most of the time series (1986–2013).	31 March 2017. But since then, no information has been received.
E.6	1.A Fuel combustion – sectoral approach – liquid fuels – CO_2 (E.15, 2016) (E.15, 2015) Transparency	Report in the submission how Slovenia intends to periodically monitor NCVs for liquid fuels.	Not resolved. In the NIR (table 10.2.1, p.333) the Party explained that it is undertaking a process to resolve this issue together with the EU and that it has included this issue as part of an EU capacity-building project. However, no specific information was provided on how Slovenia intends to periodically monitor NCVs for liquid fuels.
E.7	1.A Fuel combustion – sectoral approach – gaseous fuels – CO_2 (E.14, 2016) (E.14, 2015) Accuracy	Make all possible efforts to obtain the missing composition data for natural gas after 1996 and recalculate the emissions.	Addressing. The NIR states that Slovenia was planning to obtain data about the chemical composition of natural gas for the period after 1996 and to recalculate the CO_2 EFs and emissions for 1997 onwards (p.42). Unfortunately, data on chemical composition are not available. The NIR also explained that the natural gas distributor is not interested in obtaining such data and that implementation of regular sampling and analysing in an accredited laboratory would introduce unreasonable costs. However, the ERT is of the view that the Party may have other options for obtaining the composition data. For example, the natural gas distributor could lower the frequency of sampling and analysing to an affordable rate; or the Party could conduct a study similar to that done in 1998 to determine carbon content in natural gas (see p.42 of the NIR); or the Party might obtain composition data on natural gas from the three importing sources and then calculate a weighted average CO_2 EF for natural gas on the basis of imported volumes, given that Slovenia has negligible domestic production (less than 0.6 per cent in 2016) of natural gas and almost all its natural gas is supplied by the Russian Federation (delivery started in 1978), Algeria (delivery started in 1992) and Austria (delivery started in 2001).
E.8	1.A.3.b Road transportation – liquid fuels – CO_2 (E.11, 2016) (E.11, 2015) (35, 2014) (34, 2013) Transparency	Continue to improve the characterization of the physical and chemical properties of gasoline and diesel fuel for road transportation and report on the results achieved.	Addressing. The Party explained that data are not available. According to the NIR (p.89), the Party is investigating options for obtaining more information on the properties of these fuels. During the review, the Party further explained that this is an issue under consideration on the broader level of the EU member States.
E.9	1.A.4.c Agriculture/forestry/ fishing – all fuels – CO_2, CH_4 and N_2O (E.12, 2016) (E.12, 2015) (33, 2014) Accuracy	Update the coefficient used to quantify fuel consumption in this subcategory so that it reflects technological variations in the use of and features of the machinery used for agricultural purposes.	Resolved. During the review, the Party explained that it had tried to obtain new data to update the energy intensity coefficient through a project already finished by Slovenia's agriculture institute, but no such data are available. The Party further explained that the coefficient used is still quite suitable and that improvement of this factor would have no or negligible influence on the estimated total GHG emissions. Referring

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			to paragraph 73 of decision 13/CP.20, the ERT accepted this explanation.
E.10	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.16, 2016) (E.16, 2015) Transparency	Determine how the natural gas produced within the country is used and/or processed to better understand all emission pathways associated with this gas production, and document the results of this investigation in the NIR.	Resolved. The NIR (p.109) indicates that there is no processing of natural gas in Slovenia, and that gas production in Slovenia is of a very small amount and is transported directly, without processing, to the chemical plant near the place of production.
E.11	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.17, 2016) (E.17, 2015) Transparency	Correct table 3.3.13 in the NIR and improve QA/QC procedures to avoid such mistakes in the future (incorrect AD, EFs and methodology regarding the percentage shares of pipelines built in different time periods).	Resolved. NIR table 3.3.13 has been corrected. Emission estimates could be replicated by the ERT, suggesting that QA/QC procedures have been improved.
IPPU			
I.1	2.A.4 Other process uses of carbonates – CO_2 (I.7, 2016) (I.7, 2015) Transparency	Include in the NIR data on soda ash imports, soda ash exports and soda ash used in glass production.	Resolved. During the review, Slovenia stated that the data on soda ash imports, exports and soda ash used in glass production are confidential and could not be provided in the NIR. The Party noted that these data would be available to future ERTs during the review process. The ERT accepts this response.
I.2	2.A.4 Other process uses of carbonates – CO_2 (I.8, 2016) (I.8, 2015) Consistency	Estimate the emission levels for bricks and ceramics production for 1990–1994 using a robust extrapolation method relevant to the country's circumstances, taking into account factors such as the peaking of the country's construction industry in 2006 and the 2008 economic crisis.	Not resolved. Slovenia did not perform a recalculation of the CO_2 emissions for bricks and ceramics production for 1990–1994. During the review, the Party explained that it focused its improvements on issues that affected more recent years, and will try to recalculate the time series of emissions for 1990–1994 in the next submission.
I.3	2.F Product uses as substitutes for ozone-depleting substances – HFCs (I.9, 2016) (I.9, 2015) Transparency	Update the references to the table of EFs (change the reference from NIR table 4.14.2 to table 4.6.2) in this category and strengthen QA/QC procedures to ensure internal consistency of the NIR and transparency.	Resolved. The reference has been updated, suggesting that QA/QC procedures have been strengthened. NIR table 4.6.2 is available on page 159 of the NIR.
I.4	2.F.1 Refrigeration and air conditioning – HFCs (I.4, 2016) (I.4, 2015) (45, 2014) Transparency	Include a justification in the NIR for the use of country-specific values for the lifetime of domestic refrigeration and air-conditioning equipment.	Resolved. The assumed lifetime of domestic refrigeration equipment is 15 years (the 2006 IPCC Guidelines (vol. 3, chapter 7, table 7.9) indicate a range of 12–20 years). The value is based on expert opinion and sufficient justification has been provided in the NIR (p.159). The ERT has determined that it is reasonable for that kind of equipment.
I.5	2.G Other product manufacture and use – SF_6 and PFCs (I.10, 2016)	Include category-specific sections for electrical equipment as well as for SF_6 and PFC emissions from other product use, including uncertainty and	Resolved. Category-specific sections on uncertainty and time-series consistency, QA/QC and verification, recalculations and planned improvements are included in the NIR. Section 4.7.1 covers information for category 2.G.1

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(I.10, 2015) Consistency	time-series consistency, QA/QC and verification, recalculations and planned improvements.	electrical equipment and section 4.7.2 covers information for category 2.G.2 SF_6 and PFCs from other product use (NIR, pp.163–164).
I.6	2.G Other product manufacture and use – SF_6 and PFCs (I.10, 2016) (I.10, 2015) Consistency	Strengthen QA/QC procedures to ensure the accuracy of the information in the NIR (clarify that NIR sections 4.7.2.3–4.7.2.6 relate to electrical equipment as well as SF_6 and PFCs from other product use).	Resolved. NIR sections 4.7.2.3–4.7.2.6 are part of section 4.7.2 "SF_6 and PFCs from other product use (CRF 2.G.2)". Corresponding information is reported in sections 4.7.1.3–4.7.1.6 for electrical equipment.
I.7	2.G.1 Electrical equipment – SF_6 (I.6, 2016) (I.6, 2015) (46, 2014) (46, 2013) Transparency	Include information regarding the methodology used for the calculation of the SF_6 emissions from the disposed electrical equipment.	Resolved. Information on the methodology is provided in section 4.7.1.2 (p.163) of the NIR.
Agriculture			
A.1	3.A Enteric fermentation – CH_4 (A.6, 2016) (A.6, 2015) Transparency	Include animal performance data in the NIR, such as milk production, feeding situation, work hours, pregnancy rate and digestibility rate.	Addressing. The Party has reported on the animal performance data, including feeding situation, pregnancy rate and digestibility rate in the NIR (p.172), but not on work hours. During the review, the Party clarified that, in Slovenia, cattle have not been used for work for decades. However, this information was not provided in the NIR.
A.2	3.B Manure management – CH_4 and N_2O (A.8, 2016) (A.8, 2015) Transparency	Report the usage percentage data for the percentage of manure treated under anaerobic digesters under the digester column in CRF table 3.B.(a)s2.	Not resolved. In the NIR (p.184), the Party has reported that between 2006 and 2010 the proportion of cattle manure treated in anaerobic digesters increased from 0.03 to 0.36 per cent, and this same value of 0.36 per cent was applied for subsequent years. However, in CRF table 3.B.(a)s2, the Party continues to report the percentage usage of digesters for cattle manure as "NO", "IE" or "NA".
A.3	3.B Manure management – N_2O (A.11, 2016) (A.11, 2015) Accuracy	Provide additional information in the NIR on Nex rates for livestock other than dairy cattle and demonstrate that those parameters are appropriate in the specific national circumstances and more accurate than the default data provided in the 2006 IPCC Guidelines.	Not resolved. Compared with the 2016 annual submission, additional information has not been provided in the 2018 NIR. The Party has provided the Nex rates for sows (36 kg/head/year) and fattening pigs (14 kg/head/year) used in the calculations in table 5.4.2 of the NIR and indicated that these values are obtained from the 2002 *Atmospheric emission inventory guidebook*. However, the Party has not demonstrated that those parameters are appropriate to the specific national circumstances and are more accurate than the default data provided in the 2006 IPCC Guidelines.
A.4	3.B.1 Cattle – CH_4 and N_2O (A.1 and A.7, 2016) (A.1 and A.7, 2015) (51, 2014) (50, 2013) Accuracy	Make all efforts to include the latest information obtained by SORS on MMS applied on cattle farms.	Resolved. Slovenia uses a consistent time series of SORS data based on farm structure. The Party has investigated the use of supplemental sample survey data from a 2010 survey based on agricultural production (see p.183 of the NIR) and determined that, because the differences between this data set and the currently used

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			SORS data cannot be explained, and because the SORS data include a more complete time series (available for 2003, 2005, 2007, 2010 and 2013), it was preferable to continue to use the SORS data to estimate the allocation to MMS. The Party further explained that there are almost 33,000 agricultural holdings that keep cattle in Slovenia and the only option to update information is through official statistics (possibly through an initiative to collect and publish data to SORS). Given the current national circumstances, the ERT agrees with the Party's conclusion to continue using the SORS data while exploring the possibility of initiating collection and publication of data on agriculture production methods by SORS.
A.5	3.B.1 Cattle – CH_4 and N_2O (A.2 and A.7, 2016) (A.2 and A.7, 2015) (51, 2014) Accuracy	Take into consideration housing technology types (e.g. loose housing or tie stall housing) used in cattle farms when developing/updating the AWMS matrix.	Resolved. The ERT notes that the Party has used information on housing technology types used in cattle farms when updating the AWMS (now referred to as MMS) matrix (see table 5.4.3 in the NIR).
A.6	3.B.3 Swine – N_2O (A.3, 2016) (A.3, 2015) (54, 2014) (52, 2013) (77, 2012) Transparency	Improve the transparency of the information provided for this category and provide a description of the development of the average Nex rate for swine.	Not resolved. The Party continues to report the Nex rates applied in table 5.4.2 of the NIR. However, no additional information on the development of the average Nex rate for swine has been provided in the NIR.
A.7	3.B.3 Swine – CH_4 and N_2O (A.4, 2016) (A.4, 2015) (52, 2014) Accuracy	Conduct an investigation and update the AWMS matrix for swine because the practice of organic farming may include deep litter MMS or pasture and paddock.	Not resolved. The ERT noted that the Party has provided some information on the MMS of swine in section 5.4.2.1 and in table 5.4.4 of the NIR, in terms of EFs for farmyard manure, slurry, anaerobic lagoon and anaerobic fermenters. However, no further investigation has been demonstrated and the Party has not provided any information in the NIR on deep litter manure management or pasture and paddock.
A.8	3.B.5 Indirect N_2O emissions – N_2O (A.14, 2016) (A.14, 2015) Transparency	Provide an explanation for the omission of indirect N_2O emissions from MMS.	Resolved. The Party reports N_2O emissions from atmospheric deposition (e.g. 0.01 kt in 2016 reported in CRF table 3.B(b)). In the NIR (section 5.4.2.2) the Party has assumed that indirect N_2O emissions from manure management associated with leaching and run-off do not occur and the notation key "NO" has been used. The reported rationale for this assumption is based on the requirement to store animal manures governed by a decree on the protection of waters against pollution caused by nitrates from agricultural sources. The capacities of watertight stores are prescribed for liquid and solid manures, and storage of farmyard manure in field heaps is prohibited. During the review, the Party confirmed that the decree has been fully implemented, that inspectors supervise the implementation of the decree on individual farms

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
			and that penalties for non-compliance with the regulation are also prescribed. The ERT agrees with the explanation.
A.9	3.G Liming – CO_2 (A.15, 2016) (A.15, 2015) Consistency	Make every effort to justify the AD used to estimate emissions from lime application to agricultural soils and recalculate emissions for the period 1992–2013.	Addressing. The Party recalculated emissions from liming for 1995 onwards, although the previous ERT had recommended a recalculation for the years 1992–2013. As explained by the Party in the NIR (section 5.6.5) and as confirmed during the review, unfortunately, the SORS data (on areas and gross domestic product) are available only since 1995, and this is the main reason why recalculations for 1992, 1993 and 1994 were not provided. The Party plans to develop a new methodology for the assessment of CO_2 emissions from liming for future reporting. Additional data, which will serve as a proxy to complement the time series or to verify estimates, will be gathered (e.g. from sales records). The ERT considers that the Party has made sufficient efforts to update and recalculate the AD using the best available information, particularly for the years of the second commitment period.
LULUCF			
L.1	4. General (LULUCF) – CO_2 (L.10, 2016) (L.10, 2015) Transparency	Provide additional information explaining why the Party considers that land-use changes do not occur on organic soil areas.	Resolved. Relevant additional information was provided in the NIR (sections 6.3.4.3 and 6.4.4.2).
L.2	4. General (LULUCF) – CO_2 (L.11, 2016) (L.11, 2015) Transparency	Make efforts to complete the uncertainty assessment of all carbon pools and gases in the LULUCF sector.	Addressing. Some of the uncertainties have been estimated and chapters have been improved (see sections 6.5.4.2 and 6.6.4.2 of the NIR). However, uncertainty estimates for DOM and soils were not provided. During the review, the Party indicated that additional uncertainty estimates will be provided in the next submission.
L.3	4.A.1 Forest land remaining forest land – CO_2 (L.5, 2016) (L.5, 2015) (63, 2014) Accuracy	Search for additional data on deadwood stocks collected from observations for some of the years prior to and after 2007 in order to improve the estimates based on interpolation/extrapolation.	Addressing. Additional data on deadwood stocks prior to 2007 continue to be unavailable. During the review, the Party indicated that one possible source of data could be that of the European Environment Agency for the years 2000 and 2005 (https://www.eea.europa.eu/data-and-maps/indicators/forest-deadwood-1/assessment-1). However, the Party noted that these estimates are derived from the *State of Europe's Forests 2011* report. In particular, these estimates are based on expert judgment, which assume that the amount of deadwood is expressed as a percentage of above-ground biomass. The Party further noted that this expert judgment needs to be re-evaluated and validated.
L.4	4.A.1 Forest land remaining forest land – CO_2	Make efforts to improve the estimation of net removals in forest land and eliminate trend	Addressing. The large inter-annual fluctuations remain because of methodological issues, but new data are currently being collected. For

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(L.12, 2016) (L.12, 2015) Accuracy	gaps caused by methodologies as much as possible (trend of net removals in forest land remaining forest land shows relatively large jumps between the years 1995–1996, 2000–2001 and 2006–2007).	example, between 1995 and 1996 removals increased by 4.8 per cent and between 2000 and 2001 by 22.0 per cent. Although removals increased by only 0.4 per cent between 2006 and 2007, they declined by 12.9 per cent between 2007 and 2008.
L.5	4.A.1 Forest land remaining forest land – CO_2 (L.13, 2016) (L.13, 2015) Transparency	Revise the explanation of the scope of increment data covered by the Forest and Forest Ecosystem Condition Survey and confirm that the estimated removals from forest land remaining forest land are not double counted with removals that occur on land converted to forest land or in emissions that occur on land converted from forest land.	Resolved. The NIR provides additional explanation on the Forest and Forest Ecosystem Condition Survey data and it has been confirmed (NIR, section 6.4.8) that no double counting occurred between forest land remaining forest land and land converted to and from forest land.
L.6	4.A.2.5 Other land converted to forest land – CO_2 (L.14, 2016) (L.14, 2015) Transparency	Update the explanation of land converted to forest land in the NIR by including the soil carbon stock value used in the estimation of soil carbon stock change for this land-use change.	Resolved. Relevant information about the carbon stocks has been provided in the NIR (pp.239–240).
L.7	4.B.1 Cropland remaining cropland – CO_2 (L.15, 2016) (L.15, 2015) Accuracy	Revise the carbon stock value in orchards and vineyards used for the estimation of land conversion from perennial cropland.	Resolved. A new carbon stock value has been applied (10.38 t carbon/ha) (NIR, p.248). During the review, the Party further explained that the value was derived from the growing stock of 25.8 m^3/ha for woody crops that was measured in 2012 by the Slovenian Forestry Institute.
L.8	4.B.2 Land converted to cropland – CO_2 (L.7, 2016) (L.7, 2015) (68, 2014) (61, 2013) Accuracy	Determine and use country-specific parameters such as the changes in carbon stocks from one year of cropland growth for perennial and annual cropland.	Addressing. According to the NIR, IPCC default values continue to be used (pp.250–252). During the review, the Party indicated that it had surveyed national literature and databases on annual growth in cropland and determined that there are no country-specific data available for one year of cropland growth for perennial cropland, so the IPCC default values were used (2006 IPCC Guidelines, vol. 4, chapter 5, table 5.1). The Party did determine that growth for annual cropland could be estimated based on SORS data. The latter were obtained for major crops (such as wheat, maize and potato), but have not yet been accounted in the calculations. The Party indicated that these data and updated calculations will be included in the next annual submission.
L.9	4.B.2 Land converted to cropland – CO_2 (L.16, 2016) (L.16, 2015) Completeness	Provide information on the assumption used for the amount of living biomass carbon stock in other perennial cropland for the estimation of land conversion from perennial cropland.	Not resolved. During the review, the Party explained that other perennial cropland is removed from the assumptions as a temporary measure and that the Party continues to focus only on vineyards and orchards. The collection of additional data is currently under way in the country (see ID# L.33 in table 5).

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.10	4.B.2 Land converted to cropland – CO_2 (L.17, 2016) (L.17, 2015) Completeness	Make efforts to improve the completeness of reporting of carbon stock changes in land conversions to other perennial cropland for carbon gains that occurred after two years or more.	Addressing. In 2017, the Slovenian Forestry Institute sampled the prevailing perennial crops (14 plots in vineyards, 7 plots in intensive orchards and 42 plots in extensive orchards). In addition, 3 plots in intensive orchards and 18 plots in extensive orchards were to be sampled in 2018. During the review, the Party indicated that this will allow it to update data on stocks for certain perennial crops and provide improved estimations in the next annual submission.
L.11	4.B.2 Land converted to cropland – CO_2 (L.17, 2016) (L.17, 2015) Completeness	Eliminate double counting as far as possible in the estimation of carbon stock changes of living biomass in perennial cropland.	Resolved. No occurrence of double counting has been identified in the section of the NIR on cropland.
L.12	4.C Grassland – CO_2 (L.18, 2016) (L.18, 2015) Accuracy	Apply methodologies for woody grassland for the woody grassland subcategory (as opposed to applying methodologies for annual grassland).	Addressing. During the review, the Party discussed its current data collection efforts, particularly for land converted to grassland. However, for now, no relevant information is available in Slovenia.
L.13	4.C Grassland – CO_2 (L.18, 2016) (L.18, 2015) Accuracy	Improve the methodologies used for estimating woody grassland by including the removal factor applied to biomass growth after conversion to woody grassland and the biomass carbon stock of woody grassland used to estimate land-use conversion.	Resolved. The methodology was improved through the addition of a default carbon accumulation rate of 13.5 t dry matter/ha (NIR, p.260).
L.14	4.C.2 Land converted to grassland – CO_2 (L.8, 2016) (L.8, 2015) (69, 2014) Accuracy	Determine and use country-specific data on changes in carbon stocks from one year of grassland growth.	Resolved. Data for one year of growth for annual grassland were obtained from SORS and applied in the calculations. During the review, the Party indicated that new data on carbon stocks in perennial (woody) grassland will be obtained through ongoing data collection efforts.
L.15	4.D Wetlands – CO_2 (L.19, 2016) (L.19, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Update the explanation in section 6.6.4.1 in the NIR, which refers to peatland, and report emissions/removals using the subcategory flooded land instead of other wetlands in CRF table 4.D.	Resolved. Section 6.6.4.1 of the NIR has been updated. In CRF table 4.D, emissions/removals are reported under flooded land instead of other wetlands.
L.16	4.D Wetlands – CO_2 (L.20, 2016) (L.20, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Continue efforts to use the Wetlands Supplement in preparing annual inventories.	Resolved. See ID# L.34 in table 5.
L.17	4.E Settlements – CO_2 (L.21, 2016) (L.21, 2015) Transparency	Provide in the NIR information on the methodology used for estimating carbon stock change in living biomass in settlements remaining settlements, taking	Not resolved. No additional information on carbon stock change estimation for living biomass is provided in the NIR.

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
		into consideration whether carbon stock in the settlements area is increasing or expected to be maturing in the future, and examine the application of actual growing period if necessary.	
L.18	4.E Settlements – CO_2 (L.22, 2016) (L.22, 2015) Transparency	Provide in the NIR all necessary information to explain the methodologies applied for DOM and soil in settlements.	Resolved. Relevant information was provided in the NIR (p.273). The chapters of the NIR on settlements now discuss DOM and soil organic carbon in a more complete manner, and in a similar structure as that used for other land uses.
L.19	4.F Other land – CO_2 (L.23, 2016) (L.23, 2015) Transparency	Provide in the NIR all necessary information to explain the methodologies and assumptions applied for land converted to other land.	Not resolved. No additional information on carbon stock change estimation for living biomass is provided in the 2018 NIR compared with the 2016 NIR.
L.20	4(III) Direct N_2O emissions from N mineralization/ immobilization – N_2O (L.24, 2016) (L.24, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Use the default EF from the 2006 IPCC Guidelines (EF_1 0.01 kg N_2O-N/kg N), if there is no specific reason that the Revised 1996 IPCC Guidelines EF_1 is considered more appropriate.	Resolved. Slovenia has applied the IPCC default EF of 0.01 kg N_2O-N/kg N (NIR, p.253).
L.21	4(III) Direct N_2O emissions from N mineralization/ immobilization – N_2O (L.25, 2016) (L.25, 2015) Completeness	Estimate direct N_2O emissions from N mineralization that occurred in all land uses, including land converted to cropland.	Resolved. N_2O emissions have been estimated as appropriate, including for land converted to cropland (emissions have been reported in the agriculture sector).
L.22	4(IV).2 N leaching and run-off – N_2O (L.26, 2016) (L.26, 2015) Completeness	Estimate indirect N_2O emissions from leaching/run-off in relation to N mineralization and provide in the NIR appropriate information on the methodology applied.	Resolved. Slovenia reported N_2O emissions from leaching and run-off in CRF table 4(IV) for the entire time series (0.02 kt N_2O in 2016) and information is provided in the NIR (p.205).
L.23	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.27, 2016) (L.27, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	If a tier 1 method is applied, use the default EFs for "extra tropical forest" from the 2006 IPCC Guidelines (vol. 4, chapter 2, table 2.5) for the estimation of biomass burning.	Resolved. The Party applied the tier 1 method and used the EFs for "extra tropical forest" (NIR, section 6.4.4.2).
L.24	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.28, 2016) (L.28, 2015) Completeness	Further examine whether, where forest wildfires occur in Slovenia, these affect the DOM pool and, if appropriate, add the DOM to mass of fuel available for combustion.	Addressing. Wildfires are mentioned in the NIR (section 6.4.4.2). However, according to the NIR (p.237), owing to data availability, no other pool than above-ground biomass is taken into account for mass of fuel available for combustion.

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.25	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.29, 2016) (L.29, 2015) Completeness	Make efforts to estimate emissions for the missing years (1986, 1987, 1993 and 1994).	Resolved. A complete time series is available for 1986–2016.
L.26	4.G HWP – CO_2 (L.30, 2016) (L.30, 2015) Transparency	Fully revise the NIR (section 6.9) based on the latest methodologies applied and provide all necessary information on AD, parameters and equations applied.	Addressing. More information was provided on methodologies in section 6.9 of the NIR, including half-lives and other parameters. However, consistent information on the time series of AD is still missing.
L.27	4.G HWP – CO_2 (L.31, 2016) (L.31, 2015) Transparency	Report the correct half-life parameters in CRF table 4.Gs1.	Resolved. The default values are mentioned in the NIR (p.281). The Party provided an adequate source for the half-life parameters. Corresponding information is provided in CRF table 4.Gs1.
L.28	4.G HWP – CO_2 (L.33, 2016) (L.33, 2015) Transparency	Provide in the NIR adequate information on data and the methods used to construct the time series for the years when historical data are not available, especially for the years before 1946.	Resolved. Relevant information was provided in the NIR (pp.281–284) on the data and methods used to construct the time series, as a narrative, back to the year 1900.
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.8, 2016) (W.8, 2015) Transparency	Enhance the transparency of the sector overview, especially regarding the categorization to different treatment and management practices.	Resolved. Information about waste streams was provided in the NIR (section 7.1).
W.2	5.A Solid waste disposal on land – CH_4 (W.2, 2016) (W.2, 2015) (75, 2014) (69, 2013) Consistency	Ensure that the use of multiple sources of data for municipal solid waste disposal for different periods is in accordance with chapter 7 of the IPCC good practice guidance.	Not resolved. Multiple data sources have not been properly used to ensure the consistency of the time series (see also ID# W.3 below).
W.3	5.A.1 Managed waste disposal sites – CH_4 (W.9, 2016) (W.9, 2015) Consistency	Recalculate the population data and waste generation rate used for the period 1964–1994 to ensure consistency with actual data for the period 1995–2014.	Not resolved. Recalculation of the waste generation rate for the period 1964–1994 has not yet been performed. The ERT considers that using drivers such as gross domestic product, industrial production or data from surrounding countries could be used to recalculate the amount of deposited waste.
W.4	5.A Solid waste disposal on land – CH_4 (W.12, 2016) (W.12, 2015) Transparency	Include the details of the improvement in the screening of municipal solid waste and results of the AD in the NIR, and include an explanation for the impact of the recalculation on the category emissions and the total emissions that have resulted from the recalculation.	Resolved. Information about the improvement and recalculation was provided in the NIR of the 2017 annual submission (chapter 7 and section 10.1.5).
W.5	5.A.1 Managed waste disposal sites – CH_4	Use the 2006 IPCC Guidelines as a reference from which to source	Resolved. The MCF values of 0.6 for uncategorized solid waste disposal sites and 1.0

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(W.11, 2016) (W.11, 2015) Transparency	the correct MCF values and recalculate the CH_4 emissions if necessary.	for managed solid waste disposal sites from the 2006 IPCC Guidelines (vol. 5, chapter 3, table 3.1) are used as described in the NIR (p.296).
W.6	5.B.1 Composting – CH_4 and N_2O (W.13, 2016) (W.13, 2015) Transparency	Provide AD for the category in the NIR.	Not resolved. AD were not provided in the NIR. See ID# W.12 in table 5.
W.7	5.B.1 Composting – CH_4 and N_2O (W.13, 2016) (W.13, 2015) Accuracy	Undertake a survey to estimate the average amount of waste composted in homes and include the emission estimates in the submission.	Resolved. The Party explained during the review that no method exists in the 2006 IPCC Guidelines for this activity and that statistics in Slovenia do not include composted waste in homes. The ERT notes that household composting is referenced in the reporting and documentation section (section 4.6) of the 2006 IPCC Guidelines (vol. 5, chapter 4); however, the ERT finds that it is not mandatory in accordance with section 4.1.2 of the same chapter. See ID# W.12 in table 5.
W.8	5.D.1 Domestic wastewater – CH_4 (W.4, 2016) (W.4, 2015) (79, 2014) Transparency	Include clear explanations about the recalculations performed.	Resolved. Information about recalculations is provided in the NIR (chapter 7 and section 10.1.5).
W.9	5.D.1 Domestic wastewater – N_2O (W.14, 2016) (W.14, 2015) Completeness	Report indirect N_2O emissions or provide in the NIR quantitative estimates of these emissions for this category, so that the ERT can assess whether the sum of all emissions in this category is below 0.1 per cent of the national total GHG emissions and therefore whether these emissions are significant or insignificant in line with the UNFCCC Annex I inventory reporting guidelines.	Resolved. Slovenia used the default method in the 2006 IPCC Guidelines (vol. 5, chapter 6, section 6.3.1.1) to estimate indirect N_2O emissions from wastewater.
KP-LULUCF			
KL.1	General (KP-LULUCF) (KL.2, 2016) (KL.2, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Update chapter 11 of the NIR so that it is entirely in line with the elements specified in annex II to decision 2/CMP.8, including the update of descriptions about the methodologies and the underlying assumptions used.	Addressing. Chapter 11 of the NIR has been updated with additional information; however, Slovenia did not update the description of the methodologies and underlying assumptions used.
KL.2	General (KP-LULUCF) (KL.3, 2016) (KL.3, 2015) Transparency	Complete the CRF tables, including filling the information in CRF table NIR-3, providing the correct notation keys in cells relating to natural disturbance provision and carbon equivalent forest provision in the accounting table and providing a	Resolved. CRF table NIR-3 has been filled and notation keys for the background level and margin have been added to CRF tables 4(KP-I)A.1.1 and 4(KP-I)B.1.3. In addition, information or notation keys for the carbon equivalent forest provision and the FM cap have been provided in the CRF accounting table (see ID# KL.15 in table 5).

ID#	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
		value for forest management cap in the accounting table.	
KL.3	General (KP-LULUCF) (KL.4, 2016) (KL.4, 2015) Transparency	Provide additional information on the use of a single national boundary to clarify that it does not lead to an increase in uncertainty or reduce heterogeneity of the forest status in Slovenia.	Resolved. Relevant information was provided in the NIR (section 11.2.3).
KL.4	Deforestation – CO_2 (KL.5, 2016) (KL.5, 2015) Accuracy	Assess whether the natural disturbance area of forest land in Slovenia satisfies the guidance regarding direct human-induced deforestation taking into account the relevant guidance in the *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*, revise the data for deforestation area where applicable, and provide additional information on the result of this assessment in the submission.	Not resolved. During the review, the Party reported that deforestation areas reported under the Kyoto Protocol are similar to those calculated under the Convention. However, relevant information was not provided in the NIR.
KL.5	Deforestation – CO_2 (KL.6, 2016) (KL.6, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure that the reporting of deforestation emissions is consistent between the NIR and the CRF tables (natural disturbance emissions were excluded from deforestation emissions in the NIR).	Not resolved. As stated in the NIR (section 11.4.4) all emissions from deforestation are calculated as the area change, while disturbed forest land is still handled as forest land. Additionally, the numbers in the NIR and in the CRF tables are not consistent (e.g. Slovenia reported 447.03 kt CO_2 eq in the NIR (p.352) but 437.33 kt CO_2 eq in CRF table 4(KP-I)A.2 for 2016).
KL.6	FM – CO_2 (KL.7, 2016) (KL.7, 2015) Transparency	Correct the notation key in CRF table NIR 2-1 from "NE" to "NO" for the conversion of natural forests to planted forests.	Resolved. The Party reported "NO" in CRF table NIR 2-1.
KL.7	FM – CO_2 (KL.7, 2016) (KL.7, 2015) Transparency	Include information in the NIR stating that all forests are subject to forest management plans and that the conversion of natural forests to planted forest does not occur in Slovenia.	Resolved. Relevant information was provided in the NIR (section 11.5.5).
KL.8	FM – CO_2 (KL.8, 2016) (KL.8, 2015) Completeness	Provide in the NIR information on the technical correction and methodological consistency relating to the FMRL in accordance with the reporting requirements specified in decision 2/CMP.8, annex II, paragraph 5(e) and (f).	Resolved. Relevant information was provided in the NIR (section 11.5.7).

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
KL.9	HWP – CO_2 (KL.9, 2016) (KL.9, 2015) Transparency	Create a new section in chapter 11 of the NIR and include all the necessary information on the reporting of HWP in accordance with decision 2/CMP.8, annex II, paragraph 2(g)(i–vii).	Resolved. The NIR (section 11.3.1.1.5) describes how HWP emissions are dealt with in the second commitment period reporting.
KL.10	HWP – CO_2 (KL.10, 2016) (KL.10, 2015) Accuracy	Exclude HWP already accounted as emissions during the first commitment period from the HWP estimation under KP-LULUCF activities.	Addressing. The Party has initiated consultations with internal experts on HWP from the Thünen Institute. During the review, the Party suggested that information will be included in the next submission.
KL.11	HWP – CO_2 (KL.11, 2016) (KL.11, 2015) Accuracy	Estimate the volume of HWP resulting from deforestation on the basis of instantaneous oxidation under KP-LULUCF activities.	Not resolved. During the review, the Party indicated that this issue is in the improvement plan and it intends to address it in the next submission.
KL.12	HWP – CO_2 (KL.12, 2016) (KL.12, 2015) Transparency	Report appropriate data in CRF table 4(KP-I) (namely, harvest amounts from AR, deforestation and FM, and the half-life parameters and initial stock of HWP in each HWP type).	Addressing. Appropriate half-life parameters and initial stocks of HWP for each HWP type were provided in CRF table 4(KP-I)B.1. However, harvest amounts have not yet been provided.
KL.13	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 (KL.13, 2016) (KL.13, 2015) Completeness	Estimate this source of emissions and report these emissions under deforestation.	Resolved. N_2O emissions are reported in CRF table 4(KP-II)3.

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

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

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

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including

the review of the 2018 annual submission of Slovenia, and have not been addressed by the Party.

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

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
General		
	No issues identified	
Energy		
E.4	Develop country-specific CO_2 EFs for all fuels that have a significant share in the fuel mix for each category	7 (2010–2018)
IPPU		
	No issues identified	
Agriculture		
A.6	Improve the transparency of the information provided for this category and provide a description of the development of the average Nex rate for swine	5 (2012–2018)
A.7	Conduct an investigation and update the AWMS matrix for swine because the practice of organic farming may include deep litter MMS or pasture and paddock	3 (2014–2018)
LULUCF		
L.3	Search for additional data on deadwood stocks collected from observations for some of the years prior to and after 2007 in order to improve the estimates based on interpolation/extrapolation	3 (2014–2018)
L.8	Determine and use country-specific parameters such as the changes in carbon stocks from one year of cropland growth for perennial and annual cropland	4 (2013–2018)
Waste		
W.2	Ensure that the use of multiple sources of data for municipal solid waste disposal for different periods is in accordance with chapter 7 of the IPCC good practice guidance	4 (2013–2018)
KP-LULUCF		
	No issues identified	

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

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

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

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

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.1	QA/QC and verification	It is stated on page 18 of the 2018 NIR that the detailed process for gathering data to estimate and report emissions is described in a Manual of Procedures, which was first prepared in 2005 and further updated in 2009. In 2014, a completely new manual was prepared, which follows the structure and methodology of the 2006 IPCC Guidelines, and includes also new GHG categories. Further, on page 20 of the 2018 NIR it is stated that in 2014, Slovenia developed and implemented a new QA/QC plan, which is part of the Manual of Procedures elaborated in 2005 and updated in 2014. The manual is improved and updated regularly. In the 2016 ARR (see document FCCC/ARR/2016/SVN, ID# G.3 in table 5) the ERT had noted that, according to Slovenia, some categories were missing from the Manual of Procedures (mainly for the waste sector and F-gases in the IPPU sector) owing to limited capacity, and encouraged Slovenia to include all categories in its manual and to report on progress in fully implementing the QA/QC procedures from the 2006 IPCC Guidelines in its next submission. During the review of the 2018 annual submission, the Party commented that, at this stage, all categories except for those in the LULUCF sector are included in the Manual of Procedures. The Party further clarified that the latest version of the Manual of Procedures is dated May 2018 and that it is considered to be an internal document of the Slovenian Environment Agency, developed for inventory compilers who are working in this institution. As the LULUCF sector inventory is prepared by the Slovenian Forestry Institute, this sector has not yet been included in the manual. The ERT commends the Party for its achievements in including the additional categories in the Manual of Procedures. The ERT encourages the Party to involve the Slovenian Forestry Institute in further developing the Manual of Procedures to include the LULUCF sector, and to provide in the NIR an update on its efforts to improve the completeness of the document in accordance with its QA/QC plan.	Not an issue/problem
G.2	QA/QC and verification	In accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 19, Parties included in Annex I to the Convention should apply category-specific QC procedures for key categories and for those individual categories in which significant methodological changes and/or data revisions have occurred, in accordance with the 2006 IPCC Guidelines. In the 2016 ARR (see document FCCC/ARR/2016/SVN, ID# G.4 in table 5) the ERT noted that category-specific QC procedures were not performed for a number of key categories (e.g. 1.A.4, 2.A.3) and encouraged Slovenia to take further action in order to make sure that category-specific QA/QC is done for the key categories and to report on progress in its next submission. During the review of the 2018 annual submission, the Party stated that category-specific QA/QC procedures have been performed for the key categories and are described under the relevant chapters in the NIR. However, the ERT noted that, according to the information provided in the 2018 NIR, category-specific QC procedures were	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		still not performed for a number of key categories (e.g. 1.A.4 (NIR, p.98), 1.B.1 (NIR, p.108) and 3.D.b (NIR, p.209)), with these categories only being quality checked according to Slovenia's general QC procedures. The ERT encourages Slovenia to undertake category-specific QA/QC procedures for the key categories A.4, 1.B.1 and 3.D.b, and to report on progress in implementing these QA/QC procedures in its NIR.	
G.3	Key category analysis	A few inconsistencies have been noted between the data provided in CRF table 7 "Summary overview for key categories" and data provided in the NIR. For example, CO_2 emissions from categories 2.C.2, 4.B.1, 4.E.1 and 4.E.2 have been assessed as key categories in CRF table 7; however, only CO_2 emissions from categories 4.E (level and trend) and 4.B.1 (level) have been assessed to be key according to tables 1 and 3 of annex 1 "Key categories" to the NIR, and none of these are reported as key categories in the NIR (table 1.5.1 "IPCC Key Source Categories for 2016, Approach 1"). During the review, the Party clarified that for category 2.C.2 (ferroalloys production), emissions have been reported as "NO" since 2009 and therefore was not included in NIR table 1.5.1. Category 4.B.1 (cropland remaining cropland) is a key category and was included in NIR table 1.5.1, but with the incorrect CRF code of 4.B.2. Finally, regarding category 4.E (settlements), the Party agreed that it is a key category and should have been included in NIR table 1.5.1. The ERT recommends that Slovenia ensure better consistency between the information provided in CRF table 7 and related information in the NIR with respect to which categories are considered key.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.4	Article 3, paragraph 14, of the Kyoto Protocol	Slovenia did not provide information on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol in its annual submission. However, compared with the 2017 annual submission, the Party did provide in its 2018 submission new information, namely on its draft Development Assistance Programme for developing countries, as well as information on the increase of its climate finance in recent years. In addition, during the review the Party confirmed the following changes in its reporting under Article 3, paragraph 14: (a) In recent years, Slovenia has been increasing its climate finance. In 2016, Slovenia contributed EUR 3 million for climate finance or assistance in developing countries, representing an increase of 26 per cent compared with 2015; also, in 2016, Slovenia for the first time added resources from the "Slovenian climate change fund" (around EUR 1 million per year), where resources are gathered from the sale of allowances from the European Union Emissions Trading System. In 2017 Slovenia estimated its climate assistance to amount to EUR 3.5 million; (b) In the draft Development Assistance Programme for developing countries, which also includes climate finance, Slovenia noted that it plans to increase the annual contribution to the Climate Fund by 2030 in order for the total climate finance to reach between EUR 6 million and EUR 7 million in 2030. The current share of climate finance (in 2016) amounts to around 15 per cent of the total official development assistance, and by 2030, it would be expected to increase to least to 30 per cent, which is twice the increase in the share of climate finance, both in absolute amount and in the share of all official development assistance resources. In the field of climate finance,	Yes. Adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol

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		Slovenia indicated that it will also follow joint decisions and guidelines, both for EU- and UNFCCC-level agreements. The ERT concluded that, taking into account the confirmed changes in the reporting, the information provided is complete and transparent. The ERT recommends that the Party, in its annual submission, report any change(s) in its information provided under Article 3, paragraph 14, of the Kyoto Protocol, in accordance with decision 15/CMP.1 in conjunction with decision 3/CMP.11.	
Energy			
E.12	1. General (energy sector) – all fuel types – CO_2, CH_4 and N_2O	The Party provided in the NIR (annex 4) an incomplete energy balance, which reveals information only on primary production, imports, exports, international marine bunkers, stock changes and gross inland deliveries. Information on the whole picture of the general energy flow (from energy production to transformation to transmission losses to end-use sectors as well as statistical differences) is not illustrated. During the review, the Party provided a complete set of energy balance tables for 2016, which were exported from the 'joint questionnaires' that are prepared by SORS. The ERT notes that it is useful to compare such data with AD of fuel combustion and non-energy use. The ERT encourages Slovenia to provide in the NIR a complete set of its national energy balance tables, such as those provided to the ERT during the review (i.e. using the data exported from the 'joint questionnaires').	Not an issue/problem
E.13	Fuel combustion – reference approach – all fuel types – CO_2	In order to compare the sectoral approach with the reference approach, the Party calculated CO_2 emissions by the reference approach in accordance with the 2006 IPCC Guidelines. However, data sources for the NCVs of individual fuel types, along with the corresponding carbon EFs used in the reference approach were not indicated in the NIR. During the review, the Party indicated that all AD and NCVs are from SORS and all carbon EFs, except for lignite and natural gas, are from the 2006 IPCC Guidelines (vol. 2, chapter 1, table 1.3). For lignite and natural gas, country-specific carbon EFs are used. The ERT recommends that Slovenia indicate, for the reference approach, which data sources were used for the NCVs of individual fuel types, along with the respective carbon EFs.	Yes. Transparency
E.14	Feedstocks, reductants and other non-energy use of fuels – gaseous fuels – CO_2	Since 2011, the total amount of Slovenia's non-energy use of natural gas is used as a raw material for production of inorganic chemicals (NIR, p.49, table 3.2.10); however, the fraction of carbon stored is assumed to be 1 (NIR, p.48, table 3.2.9) and CO_2 emissions from this non-energy use are reported as "NO" in CRF table 1.A(d). During the review, the Party explained that the inorganic chemical being produced is hydrogen, which is produced by the steam reforming of natural gas. During this process, CO_2 is produced, captured (around 70 per cent efficiency according to the Party) and stored in cylinders and then sold to other users, mostly to the beverage industry. To the Party's knowledge, there is no default value for the fraction of carbon stored for non-energy use of natural gas in the 2006 IPCC Guidelines, nor is there any methodology for the calculation of the CO_2 emissions from hydrogen production. Thus, the Party had assumed that all carbon captured is stored in the product.	Yes. Transparency

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		However, the ERT noted that, according to the 2006 IPCC Guidelines (vol. 3, section 1.2.2, p.1.7), quantities of CO_2 for later use and short-term storage should not be deducted from CO_2 emissions, except when the CO_2 emissions are accounted for elsewhere in the inventory. In addition, according to the 2006 IPCC Guidelines (vol. 3, section 1.4.1, p.1.15), the inventory compiler has the task of minimizing omissions and avoiding double counting of emissions from fossil carbon bearing products and ensuring that all sources have been identified and correctly allocated to a category. Finally, the 2006 IPCC Guidelines (vol. 3, section 1.4.4.1, p.1.24) note that CO_2 emissions related to the use of fossil fuels for non-energy purposes reported in categories other than IPPU are to be added to the appropriate 1.A subcategories. Taking into account the above-mentioned information and guidelines, the ERT is of the view that there is no carbon storage for the natural gas use in this case, and that the Party was required to include the CO_2 emissions from "non-energy" use of the natural gas in the national total. During the review, the Party revised its estimates by reporting 100 per cent of the CO_2 emissions from the natural gas used as feedstock for hydrogen production under category 2.B.10 other, and submitted revised CRF tables for the whole time series from 1986 (Slovenia's base year under the Convention) to the latest inventory year 2016 on 28 September 2018. The ERT accepted the revised estimates, which increased IPPU sector emissions from 2011 onwards (e.g. by 10.81 kt CO_2 eq (2013), 11.24 kt CO_2 eq (2014), 12.65 kt CO_2 eq (2015) and 13.73 kt CO_2 eq (2016)). The ERT recommends that Slovenia update its NIR to reflect the revised estimates for CO_2 emissions from natural gas used as a feedstock for hydrogen production, including providing information on the applied methodology, AD and EFs, as well as any assumptions adopted, if applicable.	
E.15	1.A.1.c Manufacture of solid fuels and other energy industries – gaseous fuels – CO_2, CH_4 and N_2O	Slovenia reports "NO" for natural gas consumption for oil and gas extraction for 1986–2005 and for 2007. This activity occurred in those years. During the review, the Party explained that historical data on natural gas used for oil and gas extraction are not available separately and that the emissions are included as statistical differences in the emissions reported under subcategory 1.A.4.a commercial/institutional. The ERT recommends that Slovenia make all possible efforts to improve the time-series consistency of this subcategory by reallocating the CO_2, CH_4 and N_2O emissions from natural gas consumption for oil and gas extraction from 1986 until 2005 and for 2007 from category 1.A.4.a to subcategory 1.A.1.c.ii or, if this is not possible, provide reasons and report the notation key "IE" for natural gas consumption for this subcategory from 1986 until 2005 and for 2007, with a description that the emissions from this subcategory are reported under 1.A.4.a commercial/institutional.	Yes. Consistency
E.16	1.A.2.d Pulp, paper and print – biomass – CO_2, CH_4 and N_2O	The NIR (p.70) reports that the Party obtained data from the pulp and paper industry about the consumption of black liquor from 2004 to 2006, and that from 2007 onwards there has been no consumption of black liquor. During the review, the Party explained that, in Slovenia, sulfite liquor (black liquor) is partly dried and then used as a fuel in the production of magnesium pulp in one plant. The Party further explained that the data on black liquor for inventory year 2004 were obtained for preparation of the National Allocation Plan and those for 2005–2006 were obtained from European Union Emissions Trading System reports. Data for the years before 2004 were missing at the time of the 2018 annual submission, and the Party confirmed that pulp production and	Yes. Completeness

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		combustion of black liquor ceased in Slovenia as of August 2006. The Party also indicated that the pulp producer has been contacted and the missing data on black liquor for the period 1986–2003 are now available. Given that the complete time series of data are now available, the ERT recommends that Slovenia report GHG emissions from black liquor consumption for the period 1986–2003.	
E.17	1.A.3.e.i Pipeline transport – gaseous fuels – CO_2, CH_4 and N_2O	The NIR (p.90) indicates that emissions from natural gas combusted in compressor stations have been reported in subcategory 1.A.3.e other transportation, and that the notation key "IE" has been used for the period 2005–2007, because data are not available. The Party indicated that there were no compression stations in Slovenia before 2005. However, during the review, the Party clarified that a compressor station in Kidričevo started to operate in 2002, and in 2010 the additional compressor station in Ajdovščina was built. In the CRF tables, emissions from the fuel used at compressor stations have been reported in subcategory 1.A.3.e.i from 2008 onward. For the period 2002–2007, these emissions were included in subcategory 1.A.4.a commercial/institutional because emissions from this economic sector are determined by fuel balance differences in the national statistics. According to the Party, the wrong notation key "NO" had been used in the CRF tables for the period 2002–2007. The ERT recommends that Slovenia change the notation key from "NO" to "IE" in CRF table 1.A(a).s3 for the emissions from natural gas combusted in compressor stations for the period 2002–2007, and explain in CRF table 9 where these emissions are reported. The ERT also recommends that the Party correct the information in the NIR, to clarify that there were two compressor stations in Slovenia and to indicate the proper notation keys used across the time series.	Yes. Comparability
E.18	1.A.4 Other sectors – biomass – CH_4	The ERT noted that CH_4 emissions from biomass consumption in category 1.A.4 other sectors are identified as key (level and trend) in CRF table 7; however, the Party has applied a tier 1 method to estimate these emissions, using default EFs and no explanation is provided in the NIR. During the review, the Party explained that the tier 1 method was used because necessary data for developing a country-specific CH_4 EF are not available. The Party further explained that the situation is slowly improving because, in accordance with national legislation, small combustion plants must measure the concentration of certain pollutants in flue gases at least once a year, and the data from these inspections will enable the Party to develop country-specific CH_4 EFs for biomass combustion. However, this database will not be operational for a few years. The ERT recommends that Slovenia explain in its NIR the reason(s) why it is unable to implement a higher-tier method to estimate CH_4 emissions from biomass combustion in category 1.A.4 other sectors, in accordance with the decision trees in the 2006 IPCC Guidelines. The ERT also recommends that, when the database is operational for the development of country-specific CH_4 EFs, the Party use those CH_4 EFs to calculate CH_4 emissions from biomass in 1.A.4 other sectors.	Yes. Accuracy
E.19	1.A.4.c.i Stationary – liquid fuels and biomass – CO_2, CH_4 and N_2O	The NIR indicates that only the consumption of fuel for mobile sources in agriculture/forestry is presented in subcategory 1.A.4.c (p.98), and fuel used for fishing is included under road transportation (p.93). Separate data are not available for the consumption of fuel in stationary sources (subcategory 1.A.4.c), and consequently these quantities are included under subcategory 1.A.4.a commercial/institutional. However, the ERT noted that the	Yes. Comparability

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		notation key "NO" (instead of "IE") was used for all fuel types under subcategory 1.A.4.c.i stationary in CRF table 1.A(a).s4. During the review, the Party explained that an exact list of fuels used in agriculture/forestry/fishing for stationary sources is not available, and the Party assumes that fossil fuels included in the subcategory commercial/institutional could be fuel oil, biogas and wood. The ERT recommends that Slovenia correct the notation key from "NO" to "IE" for CO_2, CH_4 and N_2O emissions from liquid and biomass fuels for the subcategory 1.A.4.c.i stationary, and explain in CRF table 9 where in the inventory these emissions are reported.	
E.20	1.B.1.a Coal mining and handling – solid fuels – CO_2	The ERT noted that the Party calculated CO_2 emissions from underground mines, and used the conversion factor of 1.8×10^{-3} t/m^3 for converting the volume of CO_2 to mass of CO_2. The ERT is of the review that by rounding the conversion factor to two decimal places (i.e. to 1.84×10^{-3} t/m^3) instead of just one, the consistency between the conversion factor of CO_2 and that of CH_4 (0.67×10^{-6} Gg/m^3) could be improved. The ERT commends Slovenia for including CO_2 emissions from underground mines in its inventory. The ERT encourages the Party to use a CO_2 conversion factor of 1.84×10^{-3} t/m^3 and recalculate the CO_2 emissions for the entire time series.	Not an issue/problem
IPPU			
I.8	2.A.2 Lime production – CO_2	Slovenia reported in the NIR (section 4.2.2, p.122) that, for the period 2005–2016, the AD used to estimate CO_2 emissions are only those from lime production in dedicated plants (i.e. those included in the European Union Emissions Trading System) and for the period 1986–2004 the AD are provided by SORS. The ERT noted that for category 2.A.2 it is good practice (2006 IPCC Guidelines, vol. 3, section 2.3.1.4) to ensure the completeness of AD by also including emissions from other industries (e.g. lime production in sugar mills, artisanal production of lime for sanitation purposes or for whitewash), whether produced by lime kilns as a marketed product or as a non-marketed intermediate reagent. During the review, Slovenia provided more information regarding the activities performed in 2017 to identify all potential sources of lime production, including checks with all data collected by SORS and communications with the people involved in permit issues. No other lime production activity was identified. The ERT commends Slovenia for the information provided and recommends that the Party describe in the NIR its research undertaken to confirm the completeness of its AD, that is, to confirm that the estimates include all marketed and non-marketed lime production in the country.	Yes. Transparency
I.9	2.A.2 Lime production – CO_2	Slovenia stated in the NIR (p.122) that there were three lime producers until the end of 2012, when one of the lime plants closed down. The Party estimates CO_2 emissions for the period 1986–2004 using an extrapolation method based on the average CO_2 IEF for later years. AD (annual production of lime) for 1986–2004 were obtained from SORS, and the EF used (0.729 t CO_2/t) is the average IEF for the period 2005–2013. The ERT noted that Slovenia included the CO_2 IEF from 2013 (0.736 t CO_2/t) in the average IEF used for the period 1986–2004, and this could affect the accuracy of the estimations because of the plant closure at the end of 2012. Slovenia acknowledged that there was an error in the extrapolation and provided the revised average CO_2 IEF for	Yes. Accuracy

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		the period 2005–2012 (0.728 t CO_2/t lime), which will be used to recalculate CO_2 emissions in the next submission. The ERT recommends that Slovenia use the revised CO_2 IEF of 0.728 t CO_2/t from the period 2005–2012 to estimate CO_2 emissions for the period 1986–2004.	
I.10	2.B.5 Carbide production – CO_2	Calcium carbide is produced by heating calcium carbonate and subsequently reducing calcium oxide (quicklime) with carbon (petroleum coke). Both steps lead to CO_2 emissions. Slovenia reported in the NIR (p.132) that calcium carbide was produced from lime, hence CO_2 emissions arose only in the process of reduction with petroleum coke. Further, Slovenia estimated CO_2 emissions for the period 1986–2008 based on the amount of calcium carbide produced. The ERT noted that to avoid double counting the petroleum coke used in the production process should be deducted from the energy sector as a non-energy use of petroleum coke (2006 IPCC Guidelines, vol. 3, section 3.6.2, box 3.4). During the review, the Party informed the ERT that all the quantities of petroleum coke used in calcium carbide production were subtracted from the energy sector and thus any possible double counting of CO_2 emissions was avoided. The ERT commends Slovenia for the information provided and recommends that the Party clarify in the NIR that the petroleum coke used for carbide production was excluded from the energy sector.	Yes. Transparency
I.11	2.C.1 Iron and steel production – CH_4	Slovenia reported in CRF table 2(I).A-Hs2 and in the NIR (p.137) that the activity primary production of pig iron from iron ore occurred only in 1986 and 1987. The CO_2 emissions were estimated based on AD (the amount of pig iron produced, as reported by iron and steel plants) and an EF was calculated from the default carbon content data obtained from the 2006 IPCC Guidelines (vol. 2, chapter 1, table 1.3). CH_4 emissions were reported as "NA". The ERT noted that the primary iron production flow could include, as a first step, sinter production (from iron ore) followed by pig iron production (from sinter) in blast furnaces, and that there are CH_4 EFs for sinter production in the 2006 IPCC Guidelines (vol. 3, chapter 4, table 4.1). During the review, Slovenia provided the ERT with information regarding the production process (i.e. that pig iron was produced in blast furnaces directly from iron ore and coke), indicating that sinter is not produced and explaining further that the process could also not be considered a 'direct reduced iron' process (for which a CH_4 EF is also available in vol. 3, chapter 4, table 4.1, of the 2006 IPCC Guidelines) because the factor in the 2006 IPCC Guidelines is based only on natural gas consumption and the process in Slovenia uses only coke. The ERT accepts the Party's explanation and recommends that Slovenia describe in the NIR the production process for the pig iron produced from iron ore in 1986–1987.	Yes. Transparency
I.12	2.C.1 Iron and steel production – CO_2	In the NIR (p.137) Slovenia stated that CO_2 emissions from pig iron production in the years 1986 and 1987 was based on the amount of pig iron produced. The EF (0.146 t CO_2/t pig iron) used was calculated based on carbon content data presented in the 2006 IPCC Guidelines (vol. 3, chapter 4, p.4.27, table 4.3 'Purchased pig iron': 0.04 kg carbon/kg). Slovenia reported that all the coke consumed in pig iron production for the period 1986–1987 was included in the energy sector. The ERT noted that by multiplying the amount of pig iron produced by the carbon content, the carbon quantity stored in the product is considered to be CO_2 emissions. However, this carbon stored	Yes. Accuracy

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		in the product should not be considered as being released into the atmosphere. The approach implemented by Slovenia results in an overestimation of CO_2 emissions in the years 1986 and 1987. The ERT recommends that the Party estimate CO_2 emissions from pig iron production based on a basic carbon balance method considering the inputs (e.g. iron ore, coke) and outputs (e.g. pig iron) in the process and update the methodological description in the NIR.	
I.13	2.C.3 Aluminium production – CO_2	Slovenia estimates CO_2 emissions from aluminium production, from anode consumption and from anode burn-off. CO_2 emissions from anode consumption are reported under category 2.C.3, while CO_2 emissions from anode burn-off are reported under category 2.C.7 – other. The ERT noted that the 2006 IPCC Guidelines (vol. 3, chapter 4, equations 4.22 and 4.23, p.4.46) provide a methodology for estimating CO_2 emissions from combustion of volatile matter released during the baking operation and from the combustion of baking furnace packing material in category 2.C.3. Reporting part of the CO_2 emissions from these processes in a category other than 2.C.3 affects the comparability of emissions reporting. Slovenia stated during the review that this approach was used based on a recommendation made in a previous review report (FCCC/ARR/2008/SVN, para. 38). The ERT encourages the Party to report all the CO_2 emissions from anode consumption and anode burn-off in category 2.C.3.	Not an issue/problem
I.14	2.F Product uses as substitutes for ozone-depleting substances – HFCs	In the NIR (p.154), Slovenia mentions that no data have been collected for the years prior to the elected base year under the Kyoto Protocol for F-gases (1995); however, the ERT noted that the NIR (p.154) mentions that the use of HFCs began in 1993. The ERT asked the Party to clarify why data are not reported for the years prior to 1995. In response, Slovenia provided information to clarify that there are no available data on use of HFCs before 1995. The Party also informed the ERT that research conducted by the Chamber of Commerce in 1999 indicated that, in some cases, HFCs have been used since 1993 but no data are available for the years 1993 and 1994. In that research the list of sources, along with the type and amount of HFC used, are available since 1995 (the elected base year under the Kyoto Protocol for F-gases for Slovenia). The ERT considers that, although 1995 is the base year for F-gases under the Kyoto Protocol, a full time series of HFC use should be reported, even for years before the base year. In the opinion of the ERT, HFCs used in 1993 and 1994 could be linked with the assessment of the stock in operating equipment in 1995. The ERT recommends that Slovenia estimate HFC emissions for 1993 and 1994. If data are not available to estimate HFC emissions for 1993 and 1994, the ERT recommends that the Party apply an extrapolation method in accordance with the 2006 IPCC Guidelines assuming that HFC use was not occurring in 1992 and before and explain the assumptions for the extrapolation in the NIR.	Yes. Completeness
I.15	2.F.1 Refrigeration and air conditioning – HFCs	The Party reported “NO” for disposal emissions from category 2.F.1.D transport equipment in CRF table 2(II)B-Hs2, despite the fact that some equipment (e.g. trucks and trailers with cooling units) is reaching assumed lifespan (e.g. six–nine years according to the 2006 IPCC Guidelines (vol. 3, chapter 7, table 7.9). The NIR (p.158) mentions that there are no centres for decommissioning old trucks and trailers in the country and old equipment is being sold abroad. However, use of that kind of HFC-containing equipment has been assumed since	Yes. Completeness

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		1995. In the opinion of the ERT, the assumption that no transport equipment containing F-gases was ever decommissioned in the country is unrealistic. The ERT asked the Party to provide a more detailed rationale behind that assumption. In response, Slovenia informed the ERT that it consulted two companies which are authorized to service the transport refrigerators and they have no evidence on any transport refrigerator disposal in the country. They confirmed that old trucks are usually sold to buyers from non-EU countries, most commonly buyers from Bosnia and Herzegovina. The Party further explained that nobody is willing to pay for decommissioning of old vehicles as long as customers are available who are willing to buy old trucks. It is quite a common practice in Slovenia that used trucks are bought from more developed countries, which after a few years of use are resold to other countries. The route of the trucks is from northern Europe towards the south and then to the east and further into Africa. In the Party's opinion, in cases where there is a transport refrigerator which is no longer operational, it would be in such poor condition that there will be no HFCs remaining in the cooling device. The ERT recommends that Slovenia provide in its NIR evidence that all transport equipment is exported before decommissioning. The ERT also recommends that the Party investigate whether part of the transport refrigeration equipment is disposed of on the national market without recovery (e.g. broken equipment but with a working refrigeration system, equipment containing less than 50 per cent fill-in and not efficiently cooling, leakage during accidents). The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimate of emissions.	
I.16	2.F.1 Refrigeration and air conditioning – HFCs	The ERT noted that in the NIR (p.158) the Party mentioned that for category 2.F.1.e mobile air conditioning it has assumed that the average lifespan of cars is 12 years. The ERT finds that this assumption is within the IPCC default range (9–16 years, from the 2006 IPCC Guidelines, vol. 3, chapter 7, table 7.9); however, it is shorter than in countries with similar national circumstances (Austria, Czechia, Hungary, Poland, Slovakia), where the assumed lifespan is usually 15 years. The ERT asked the Party to provide its rationale for assuming such a lifespan for mobile air conditioning. In its response, Slovenia provided information that the lifespan of 12 years was chosen as the middle value of the range from the 2006 IPCC Guidelines, referencing the note under table 7.9 in the 2006 IPCC Guidelines, which states that lower values are more suitable for developed countries and the higher values for developing countries. However, the Party noted that the situation is changing because the average age of cars in Slovenia has increased over the last 15 years, by as much as 3 years from 6.9 to 9.9 years. With a similar trend, the average age of vehicles that were removed from the vehicle register in Slovenia also increased. In 2016, the average age of these vehicles was 15.4 years. Together, the increasing average age of the vehicles may indirectly suggest an increasing average lifetime of vehicles. The Party therefore agrees with the 15-year lifespan which is also used in neighbouring countries. The ERT recommends that Slovenia revise its assumption of a 12-year average lifespan of cars and consider using a 15-year average lifespan for cars when estimating emissions, and justify its choice in the NIR, and recalculate these emissions if needed.	Yes. Accuracy

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I.17	2.F.1 Refrigeration and air conditioning – HFCs	Slovenia estimates HFC emissions for category 2.F product uses as substitutes for ozone-depleting substances using a tier 2a approach, which includes emissions from assembly, operation and disposal (2006 IPCC Guidelines, vol. 3, section 7.1.2.1, equation 7.4). In the NIR (p.158) for stationary air-conditioning equipment (category 2.F.1.f), Slovenia states that "emissions from disposal have not been calculated yet" and reports "NO" for disposal in CRF table 2(II)B-Hs2. The ERT considered that this situation could lead to an underestimation of HFC emissions and asked Slovenia to provide more information about the reasons for not estimating HFC emissions from disposal. In response, Slovenia explained that HFCs in stationary air conditioning were first used in 2000. The recommended range for lifespan in the 2006 IPCC Guidelines is 10–20 years (vol. 3, chapter 7, table 7.9) and the Party does not have sufficient knowledge to determine which lifespan is appropriate for the national market. Slovenia intended to use 15 years, as this value is in the middle of the default range, but acknowledged that the real lifespan could be closer to 20 years. The ERT notes that if the lifespan is 15 years, as intended by the Party, disposal emissions should have been reported in 2016 for the first time. However, the Party postponed this reporting for one year with the aim of obtaining any information on typical remaining charge and recovery efficiency: the range for both factors in the 2006 IPCC Guidelines is from 0 to 80 per cent. Slovenia also informed the ERT that disposal emissions in 2016 are not substantial, because the amount of HFCs in stationary air conditioning in 2000 was small and the emissions from the use in that year were less than 1 kt CO_2 eq. The ERT considers that the HFC emissions from disposal of ozone-depleting substances in stationary air conditioning are underestimated. The ERT calculated draft estimates for this category, taking into account the equipment introduced into the national market in 2000, applying conservative assumptions that 80 per cent of the fill-in is in the equipment at the moment of decommissioning and assuming a disposal loss factor based on the EU average. In addition, the ERT applied a conservativeness factor of 1.21 to this estimate, to estimate the possible change resulting from an adjustment, should an adjustment be applied, in accordance with paragraph 80(b) of the annex to decision 22/CMP.1 in conjunction with decision 4/CMP.11. The ERT considers that the missing emissions amount approximately to 8.47 kt CO_2 eq in 2016, which are less than 0.05 per cent of Slovenia's national emissions (8.87 kt CO_2 eq) for this category for 2016. Taking into account that the missing estimate is 0.048 per cent of total national emissions, the ERT did not reflect this issue in the list of potential problems and further questions raised by the ERT. The ERT recommends that Slovenia calculate and report disposal emissions for HFCs used in stationary air conditioning, and document in the NIR the methods, AD, EFs and assumptions used.	Yes. Completeness
Agriculture			
A.10	3.B.1 Cattle – CH_4 and N_2O	In relation to ID# A.4 in table 3, the ERT acknowledges Slovenia's decision to preserve the consistency of the time series and to retain the current allocation into MMS based on farm structure data from SORS. The ERT noted during the review that Slovenia acknowledged that there is a possibility to update the MMS allocation by collecting and publishing new data through SORS.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		The ERT recommends that Slovenia report in the NIR on the possibility to initiate an effort to collect and publish the data on allocation of manure into MMS from SORS.	
A.11	3.B.3 Swine – CH_4	Slovenia presented CH_4 EFs for manure management in pig production for the period 1986-2016 in table 5.3.3 of its NIR. (4.1 kg/head/year since 2014). These factors are not consistent with the values reported in CRF table 3.B(a)s1 (4.03, 3.98 and 3.93 kg/head/year for 2014, 2015 and 2016, respectively). During the review, the Party explained that there is an error in the table in the NIR and that the information reported in the CRF tables is correct.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
		The ERT recommends that the Party correct the errors in NIR table 5.3.3 to report the same CH_4 EFs for manure management from swine for the years 2014–2016 as in CRF table 3.B(a)s1.	
A.12	3.B.5 Indirect N_2O emissions – N_2O	The ERT acknowledges the Party's rationale for the reporting of "NO" for indirect N_2O emissions from leaching and run-off (see ID# A.8 in table 3), owing to the implementation of a decree on the protection of waters against pollution caused by nitrates from agricultural sources. As a result, according to the Party, storage of farmyard manure in field heaps is prohibited.	Yes. Transparency
		The ERT recommends that Slovenia provide data in the NIR on the extent of field heaps that have been reduced by way of being replaced by watertight stores.	
LULUCF			
L.29	4. General (LULUCF)	The ERT noted issues with the transparent description included in tables and paragraphs in the current NIR. For example, when copying similar information from one NIR submission to another, the reporting years referenced are not always updated to the current reporting year. Additionally, provision of units and data sources for specific information provided in tabular format would increase the transparency substantially (e.g. NIR table 6.4.3).	Not an issue/problem
		The ERT encourages the Party to review the contents and layout of the narratives in the NIR, appropriately update the information on the reported years from one submission year to another, and add data sources to NIR table 6.4.3.	
L.30	4. General (LULUCF) – CO_2	The ERT welcomes the improvements implemented based on recommendations from past review activities, which are outlined in table 3 above. At the same time, it is aware that missing data sources are mentioned as a reason for using the tier 1 emission estimations. However, the ERT noted that there are different reporting requirements for key and non-key categories, and that additional data collection projects may be considered in order to provide more information, such as the recent soil carbon inventory started in 2016 for the DOM pool in forests.	Not an issue/problem
		The ERT welcomes Slovenia's efforts and encourages it to continue implementing data collection activities.	
L.31	Land representation	The ERT was not able to establish a clear picture of the coverage of the category other land (referred to in the NIR, p.219) and its conversions as well as the different forest plantations occurring on Slovenian lands. During the review, the Party indicated that there were differences in the national understanding of similarly classified or similarly named strata for forest plantations inside and outside forests (e.g. short rotation coppice). Also, the Party	Yes. Comparability

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		noted that the classification scheme might be altered regarding the indicators used to specify land-use classes (e.g. the use of number of trees per hectare to determine grassland). The ERT encourages Slovenia to consider reclassification of the national land-use categories to the land-use categories in the 2006 IPCC Guidelines and update the criteria for the different land-use categories and provide more information on the decisions taken and assumptions used. With respect to the criteria for forest land, the ERT recommends that the Party use either crown coverage or number of trees, but not both.	
L.32	4.A Forest land – CO_2	During the review, the ERT noted that Slovenia had selected an upper boundary for the biomass expansion factor for conversion of annual net increment (including bark) to above-ground tree biomass increment (1.3 for conifers and for broadleaves) (NIR, p.239). During the review, the Party clarified that this was a mistake in understanding a note from the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. The ERT recommends that Slovenia carefully consider its choice of the biomass expansion factor for conversion of annual net increment (including bark) to above-ground tree biomass increment when estimating emissions and removals in forest land, and apply appropriate factors in accordance with the 2006 IPCC Guidelines in the calculations described in equations 6 and 12 of the NIR.	Yes. Accuracy
L.33	4.B Cropland – CO_2	Regarding the recommendation made in the previous review report that Slovenia make efforts to improve the completeness of reporting of carbon stock changes in land conversions to other perennial cropland for carbon gains that occurred after two years or more (see ID# L.10 in table 3), the ERT noted that biomass in perennial cropland is not necessarily the most prominent category of removals in Slovenia. Nevertheless, the ERT considers that an update to the growing stock and biomass values applied in the estimations of emissions from perennial cropland would be worthwhile. As already indicated by the Party during the review, additional samples for the inventory will be collected. The ERT recommends that Slovenia add samples from the study currently under way to update the growing stock and biomass values for perennial cropland as they are collected, and report the resulting EFs for this category as soon as they are available.	Yes. Accuracy
L.34	4.D Wetlands – CO_2	The ERT notes that Slovenia applies the 2006 IPCC Guidelines (vol. 4, chapter 7) to estimate CO_2 emissions from land converted to wetlands. The ERT encourages the Party to use the Wetlands Supplement when preparing its annual inventory.	Not an issue/problem
L.35	4(V) Biomass burning – CO_2, CH_4 and N_2O	During the review, the ERT sought clarification on the meaning of the statistics for the area of forest land subject to wildfires reported in the NIR (p.236) (i.e. whether the area referred to less than one half of a per cent of the total national area, or less than one half of a per cent of the forest area in Slovenia). The Party clarified that the statistics in the NIR (p.236) are a function of total forest land in Slovenia. The ERT recommends that the Party clarify that the area affected by forest fires reported in the NIR is a function of total forest land in Slovenia.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
Waste			
W.10	5. General (waste) – CO_2, CH_4 and N_2O	The ERT noted that the uncertainty estimates reported for AD and EFs are based on expert judgment for all categories in the waste sector, taking into account the standard range of uncertainty in the 2006 IPCC Guidelines (vol. 5). However, no documentation is included in the NIR regarding the procedures and contents related to elicitation of expert judgment. The ERT recommends that Slovenia include in the NIR information about how expert judgment on uncertainty for AD and EF was obtained for each category in the waste sector.	Yes. Transparency
W.11	5.A.1 Managed waste disposal sites – CH_4	The ERT noted that, for CH_4 estimations from solid waste disposal sites, Slovenia categorizes waste generated by households, other waste similar to household waste generated by manufacturing, trade, services and other industries, and waste from the public sector together into "municipal waste" (NIR, p.286). Also, the ERT noted that Slovenia estimates waste composition data for "municipal waste" based on expert judgment, screening analysis and reports from solid waste disposal sites as shown in the tables 7.2.6, 7.2.7 and 7.2.9 in the NIR. However, it is unclear whether the waste composition data in these tables adequately represent waste composition of "municipal waste". Furthermore, waste characteristics such as degradable organic carbon, water content and fossil carbon content are different among these waste streams, especially waste from household and manufacturing industry. To improve transparency and accuracy, the ERT recommends that Slovenia separate industrial solid waste from "municipal waste" and estimate CH_4 emissions from "municipal waste" and industrial solid waste separately, and explain the methodology used to estimate these emissions separately in the NIR.	Yes. Accuracy
W.12	5.B.1 Composting – CH_4 and N_2O	When providing AD for this category (see ID# W.6 in table 3), the ERT encourages Slovenia to consult with experts to estimate the average amount of waste composted in homes and assess its impact on CH_4 and N_2O emissions.	Not an issue/problem
W.13	5.D.2 Industrial wastewater – CH_4	The ERT noted that CH_4 emissions from industrial wastewater treatment are estimated based on the assumption that 93 per cent of industrial wastewater is treated by well-managed aerobic wastewater treatment plants and the remaining 7 per cent is treated by not well-managed aerobic wastewater treatment plants (NIR, p.321). According to the 2006 IPCC Guidelines (vol. 5, chapter 6, table 6.8), the MCF for well-managed aerobic wastewater treatment plants is zero, and therefore industrial wastewater which is treated by not well-managed aerobic wastewater treatment plants is used for CH_4 emission estimation with its default MCF of 0.3. During the review, Slovenia explained that since there is no information about the share of well-managed industrial wastewater treatment plants in the country, the share of domestic wastewater treated by well-managed plants (93 per cent) and not well-managed plants (7 per cent) in 2016 is also applied for industrial wastewater. However, in the view of the ERT, the share of well-managed wastewater treatment plants for industrial wastewater (in many cases wastewater is treated through an on-site system) is different to the share for domestic wastewater. Therefore, substitution of information from domestic wastewater treatment plants may lead to a potential underestimation or overestimation of emissions. During the review, Slovenia consulted with experts and	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		concluded that all industrial wastewater treatment plants in Slovenia are well managed. However, the Party determined that industrial wastewater which is treated in domestic wastewater treatment plants does produce CH_4 and that CH_4 emissions are to be estimated by applying a weighted MCF, as developed in section 7.5.2 in the NIR for category 5.C.1 CH_4 from domestic wastewater treatment. The ERT agreed with the result of the consultation with experts and the use of an updated MCF and, as a result, Slovenia submitted revised emission estimates during the review week. In its submission of CRF tables on 28 September 2018, Slovenia provided revised estimates, resulting in an increase of CH_4 emissions in this subcategory from 0.0383 Gg CH_4 to 0.702 Gg CH_4 in 2016 (this increase takes into account the issues mentioned in ID# W.14 below). The ERT agreed with the revised estimates. The ERT recommends that Slovenia provide in the NIR a detailed description of and justification for the total amount of industrial wastewater produced, the fraction of the wastewater undergoing various treatment methods (treated (e.g. well managed and not well managed) and untreated discharge to rivers, lakes and sea, if any) and the corresponding MCFs applied to the various fractions. In the case that any of the applied MCFs depart from the default MCF values in table 6.8 of the 2006 IPCC Guidelines (vol. 5, chapter 6), the ERT recommends that the Party include a justification for the country-specific value in the NIR.	
W.14	5.D.2 Industrial wastewater – CH_4	The ERT noted that Slovenia considers only the industries with the largest outputs of wastewater and high content of degradable organic carbon to estimate CH_4 emissions from industrial wastewater treatment and discharge; namely, the pharmaceutical industry followed by production of soft drinks and alcoholic beverage, meat processing, the pulp and paper industry and milk production. The 2006 IPCC Guidelines (vol. 5, chapter 6, pp.6.19–6.20) list high CH_4 gas production potential industries as pulp and paper manufacture, meat and poultry processing, alcohol, beer, starch production, organic chemical production, and other food and drink processing. The ERT noted that all industries listed by the 2006 IPCC Guidelines are included in the emission estimations for Slovenia but some subsidiary industries may be missing; for example, organic chemical industry includes only the pharmaceutical industry and other organic chemical industries are not considered. During the review, Slovenia provided information about the existence of other organic chemical industries. In its submission of revised estimates on 28 September 2018 (see ID# W.13 above), Slovenia provided AD and CH_4 emissions for other organic chemical industries for 2004–2016. The ERT agreed with the revised estimates and recommends that Slovenia determine whether emissions from organic chemical industries other than the pharmaceutical industry also occurred in the period 1986–2003 and include the amount of wastewater output from 1986 to 2016 in NIR table 7.5.6 and update the whole time series of total organics in wastewater in industrial wastewater in NIR table 7.5.5 to ensure completeness, transparency and time-series consistency.	Yes. Completeness
W.15	5.D.2 Industrial wastewater – CH_4	In response to a question raised by the ERT in evaluating the Party's responses to the issues raised in ID#s W.13 and W.14 above, Slovenia explained that AD for CH_4 emissions from industrial wastewater treatment are calculated by using the amount of wastewater output (m^3) and COD concentration (kg COD/m^3) of outlet wastewater in each industry. However, according to the 2006 IPCC Guidelines (vol. 5, chapter 6, p.6.21), AD for	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		this category must be the COD load to industrial wastewater treatment plants, which can be estimated using values for inlet COD concentration and the amount of wastewater output by each industry. Slovenia confirmed the incorrect use of COD concentration data. In its submission of revised estimates on 28 September 2018 (see ID#s W.13 and W.14 above), Slovenia used default inlet COD data from table 6.9 of the 2006 IPCC Guidelines (vol. 5, chapter 6), because country-specific COD concentration data for each industry are not available. The ERT agreed with the use of default COD concentration data suggested by the Party. The ERT recommends that Slovenia provide in the NIR a detailed description about the inlet COD concentration used for calculating AD in each industry.	
KP-LULUCF			
KL.14	FM – CO_2, CH_4 and N_2O	The ERT noted that for reporting under the Kyoto Protocol, Slovenia adapted a forest definition based on specific criteria that resulted in a definition different than that used under the Convention. However, the Party indicated in the NIR (p.344) that reporting was consistent between the Convention and the Kyoto Protocol. During the review, the Party clarified that the NIR was referring to the fact that consistent sources for AD were used for reporting under the Convention and under the Kyoto Protocol. The Party further clarified that, in practice, regarding the forest definition, it applies the forest definition from the Convention also under the Kyoto Protocol even if the selected criteria were different. By applying the exact criteria of the Kyoto Protocol, the area under managed forest land should be slightly larger. The Party further noted that the criterion of minimum area is the same, therefore it assumes any difference in CO_2 sinks would be minimal. The ERT recommends that the Party work further on harmonization of the forest definition and its implementation to classify the same patches of land as forest under both the Convention and the Kyoto Protocol.	Yes. Comparability
KL.15	FM – CO_2, CH_4 and N_2O	In its CRF accounting table, the Party reported an FM cap of 5,691.723 t CO_2 eq. The ERT notes that the FM cap reported in the review of the report to facilitate the calculation of the assigned amount was 5,691.720 t CO_2 eq (see document FCCC/IRR/2016/SVN, table 4). The ERT further notes that, according to paragraph 12 of decision 6/CMP.9, the FM cap shall remain fixed for the second commitment period. The ERT recommends that Slovenia update the FM cap, reporting the value of 5,691.720 t CO eq in the CRF accounting table, as contained in the review of the report to facilitate the calculation of the assigned amount for the Party.	Yes. Accuracy

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

VI. Application of adjustments

11. The ERT did not identify the need to apply any adjustments to the 2018 annual submission of Slovenia.

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

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

VIII. Questions of implementation

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

Annex I

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

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

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

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–3 171.00
Base year	15 890.91	20 425.86	NA	NA	NA		NA	
1990	14 501.38	18 711.14	NA	NA				
1995	14 866.48	18 792.49	NA	NA				
2000	14 395.20	19 140.81	NA	NA				
2010	14 373.85	19 691.26	NA	NA				
2011	14 418.35	19 711.56	NA	NA				
2012	13 844.27	19 132.78	NA	NA				
2013	13 640.40	18 426.17	NA	NA		431.94	NA	–4 702.20
2014	11 775.39	16 694.91	NA	NA		436.40	NA	–4 876.50
2015	11 910.06	16 888.40	NA	NA		441.47	NA	–4 970.87
2016	12 758.08	17 747.87	NA	NA		447.03	NA	–5 013.14

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

[a] "Base year" refers to the base year under the Kyoto Protocol, which is 1986 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs, SF_6 and NF_3. Slovenia 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 FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party did not report indirect CO_2 emissions in CRF table 6.

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

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

Table 7
Greenhouse gas emissions by gas for Slovenia, excluding land use, land-use change and forestry, 1986–2016
(kt CO_2 eq)

	CO_2[a]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	SF_6	*NF_3*
1986	16 649.59	2 679.63	921.01	NO	233.19	NO	9.77	NO
1990	15 074.43	2 590.81	828.48	NO	207.59	NO	9.83	NO
1995	15 244.45	2 484.32	888.08	35.36	128.14	NO	12.13	NO
2000	15 430.09	2 562.58	956.59	46.78	129.75	NO	15.01	NO
2010	16 352.63	2 289.08	762.10	259.83	9.64	NO	17.99	NO
2011	16 353.17	2 277.45	770.08	272.55	20.16	NO	18.15	NO
2012	15 811.62	2 220.66	771.80	294.26	18.11	NO	16.34	NO
2013	15 177.89	2 160.07	743.29	312.44	15.31	NO	17.16	NO
2014	13 523.82	2 058.41	751.24	329.03	15.22	NO	17.19	NO
2015	13 611.79	2 122.88	773.98	346.51	15.74	NO	17.49	NO
2016	14 413.52	2 162.39	781.14	353.60	19.78	NO	17.44	NO
Per cent change 1986–2016	**–13.4**	**–19.3**	**–15.2**	**NA**	**–91.5**	**NA**	**78.5**	**NA**

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

Table 8
Greenhouse gas emissions by sector for Slovenia, 1986–2016
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1986	16 377.53	1 391.25	2 013.88	–4 534.95	710.53	NO
1990	14 645.26	1 375.65	1 933.07	–4 209.76	757.15	NO
1995	15 111.32	1 067.54	1 836.54	–3 926.01	777.10	NO
2000	15 244.45	1 150.02	1 881.42	–4 745.60	864.91	NO
2010	16 320.02	1 000.82	1 722.99	–5 317.40	647.43	NO
2011	16 329.28	1 031.68	1 700.43	–5 293.21	650.17	NO
2012	15 766.65	1 056.39	1 682.55	–5 288.51	627.20	NO
2013	15 035.50	1 118.58	1 666.54	–4 785.77	605.55	NO
2014	13 249.15	1 157.31	1 714.94	–4 919.52	573.51	NO

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
2015	13 397.99	1 148.25	1 754.29	–4 978.34	587.87	NO
2016	14 241.84	1 146.44	1 777.08	–4 989.79	582.52	NO
Per cent change 1986–2016	**–13.0**	**–17.6**	**–11.8**	**10.0**	**–18.0**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in the total GHG emissions. (2) Slovenia did not report indirect CO_2 emissions in CRF table 6.

Table 9

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

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–3 171.00				
Technical correction				NE				
Base year	NA				NA	NA	NA	NA
2013		NA	431.94	–4 702.20	NA	NA	NA	NA
2014		NA	436.40	–4 876.50	NA	NA	NA	NA
2015		NO, NA	441.47	–4 970.87	NA	NA	NA	NA
2016		NO, NA	447.03	–5 013.14	NA	NA	NA	NA
Per cent change base year–2016					**NA**	**NA**	**NA**	**NA**

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

[a] Slovenia 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 FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

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

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

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

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) FM: commitment period accounting
	(d) CM: not elected
	(e) GM: not elected
	(f) RV: not elected
	(g) WDR: 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-year GHG emissions, excluding LULUCF	711.465 kt CO_2 eq (5 691.720 kt CO_2 eq for the duration of the commitment period) (see ID# KL.15 in table 5)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2016	NA
2. Deforestation in 2016	NA
3. FM in 2016	NA
4. CM in 2016	NA
5. GM in 2016	NA
6. RV in 2016	NA
7. WDR in 2016	NA

Annex II

Information to be included in the compilation and accounting database

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

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

	Original submission	*Revised estimate*	*Adjustment*	*Final*
CPR	89 483 204			89 483 204
Annex A emissions for 2016				
CO_2	14 399 789	14 413 519		14 413 519
CH_4	2 145 809	2 162 393		2 162 393
N_2O	781 142			781 142
HFCs	353 602			353 602
PFCs	19 781			19 781
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	17 436			17 436
NF_3	NO			NO
Total Annex A sources	**17 717 560**	**17 747 874**		**17 747 874**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2016				
3.3 AR	NO, NA			NO, NA
3.3 Deforestation	447 029			447 029
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2016				
3.4 FM	–5 013 143			–5 013 143

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

	Original submission	*Revised estimate*	*Adjustment*	*Final*
Annex A emissions for 2015				
CO_2	13 599 142	13 611 791		13 611 791
CH_4	2 107 060	2 122 884		2 122 884
N_2O	773 982			773 982
HFCs	346 510			346 510
PFCs	15 740			15 740
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	17 493			17 493
NF_3	NO			NO
Total Annex A sources	**16 859 927**	**16 888 400**		**16 888 400**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	NO, NA			NO, NA

	Original submission	*Revised estimate*	*Adjustment*	*Final*
3.3 Deforestation	441 472			441 472
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	–4 970 866			–4 970 866

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

	Original submission	*Revised estimate*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2	13 512 576	13 523 820		13 523 820
CH_4	2 042 846	2 058 409		2 058 409
N_2O	751 240			751 240
HFCs	329 035			329 035
PFCs	15 221			15 221
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	17 189			17 189
NF_3	NO			NO
Total Annex A sources	**16 668 108**	**16 694 914**		**16 694 914**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	NA			NA
3.3 Deforestation	436 401			436 401
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–4 876 501			–4 876 501

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

	Original submission	*Revised estimate*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2	15 167 077	15 177 890		15 177 890
CH_4	2 145 368	2 160 071		2 160 071
N_2O	743 294			743 294
HFCs	312 437			312 437
PFCs	15 315			15 315
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	17 162			17 162
NF_3	NO			NO
Total Annex A sources	**18 400 653**	**18 426 170**		**18 426 170**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	NA			NA
3.3 Deforestation	431 941			431 941
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–4 702 202			–4 702 202

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines and for which the ERT determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) CO_2, CH_4 and N_2O emissions from black liquor consumption for the period 1986–2003 (category 1.A.2.d) (see ID# E.16 in table 5);

(b) HFC emissions from product uses as substitutes for ozone-depleting substances for the period 1990–1994 (category 2.F) (see ID# I.14 in table 5);

(c) HFC emissions from disposal of transport equipment (category 2.F.1.D) (see ID# I.15 in table 5);

(d) HFC emissions from disposal of stationary air-conditioning equipment (category 2.F.1) (see ID# I.17 in table 5);

(e) CO_2 emissions from land converted from perennial cropland, other than vineyards and orchards (category 4.B.2) (see ID#s L.9 and L.10 in table 3);

(f) CO_2, CH_4 and N_2O emissions from the DOM pool due to wildfires (see ID# L.24 in table 3);

(g) CH_4 emissions from industrial wastewater treatment (i.e. other organic chemical industries for 1986–2003) (category 5.D.2) (see ID# W.14 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

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

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

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

Annual review reports

Reports on the individual reviews of the 2010, 2011, 2012, 2013, 2014, 2015 and 2016 annual submissions of Slovenia, contained in documents FCCC/ARR/2010/SVN, FCCC/ARR/2011/SVN, FCCC/ARR/2012/SVN, FCCC/ARR/2013/SVN, FCCC/ARR/2014/SVN, FCCC/ARR/2015/SVN and FCCC/ARR/2016/SVN, respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at https://unfccc.int/sites/default/files/resource/AGI%20report_2018.pdf.

Annual status report for Slovenia for 2018. Available at https://unfccc.int/sites/default/files/resource/asr2018_SVN.pdf.

European Monitoring and Evaluation Programme/Core Inventory of Air Emissions. 2002. *Atmospheric emission inventory guidebook*. Volume 2. European Environment Agency.

Forest Europe, United Nations Economic Commission for Europe, and Food and Agriculture Organization of the United Nations. 2011. *State of Europe's Forests 2011. Status and Trends in Sustainable Forest Management in Europe*. Oslo: Ministerial Conference on the Protection of Forests in Europe. Available at https://www.foresteurope.org/documentos/State_of_Europes_Forests_2011_Report_Revised_November_2011.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Tajda Mekinda Majaron (Slovenian Environment Agency), including additional material on the methodology and assumptions used. The following documents [1] were also provided by Slovenia:

European Commission. May 2000. 2000/532/EC. Replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste.

[1] Reproduced as received from the Party.

European Environment Agency. April 2018. *Final Review Report. Slovenia. 2018 annual review of national greenhouse gas inventory data pursuant to Article 19(2) of Regulation (EU) No 525/2013*. 20 April 2018. Version of 29 June 2018, including corrected Table 4.

European Environment Agency. April 2017. *Final Review Report. Slovenia. 2017 annual review of national greenhouse gas inventory data pursuant to Article 19(2) of Regulation (EU) No 525/2013*. 20 April 2017.

European Environment Agency. August 2016. *Final Review Report. Slovenia. 2016 comprehensive review of national greenhouse gas inventory data pursuant to Article 19(1) of Regulation (EU) No 525/2013*. 23 August 2016.

European Environment Agency. November 2017. *Final Review Report. Slovenia. 2017 Comprehensive Technical Review of National Emission Inventories pursuant to the Directive on the Reduction of the National Emissions of Certain Atmospheric Pollutants (Directive (EU) 2016/2284)*. 30 November 2017.

RCERO Ljubljana. February 2017. Welcome to RCERO Ljubljana. Ljubljana Regional Waste Management Centre.

Slovenian Environment Agency. May 2018. *Slovenian Greenhouse Gas Inventory. Manual of procedures. Based on the methodology described in 2006 IPCC Guidelines for National Greenhouse Gas Inventory*. Ljubljana.