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Report on the individual review of the annual submission of Slovakia submitted in 2015*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol, with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2015 annual submission of Slovakia, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 5 to 10 September 2016, in Bonn, Germany.

* In the symbol for this document, 2015 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

I. Introduction[1]

1. This report covers the review of the 2015 annual submission of Slovakia organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (hereinafter referred to as the UNFCCC review guidelines) and particularly part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 5 to 10 September 2016 in Bonn, Germany, and was coordinated by Ms. Suvi Monni and Mr. Pedro Torres (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of Slovakia.

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

Area of expertise	*Name*	*Party*
Generalist	Mr. Ricardo Fernandez	European Union
	Mr. Michael Strogies	Germany
Energy	Mr. Jerome Elliott	Bahamas
	Ms. Carmen Meneses Lopez	Bolivarian Republic of Venezuela
	Mr. Anand Sookun	Mauritius
	Ms. Songli Zhu	China
IPPU	Ms. Valentina Idrissova	Kazakhstan
	Mr. Kakhaberi Mdivani	Georgia
Agriculture	Ms. Marta Alfaro	Chile
	Mr. Yuriy Pyrozhenko	Ukraine
LULUCF	Mr. Javier Fernandez	Costa Rica
	Mr. Vladimir Korotkov	Russian Federation
	Ms. Diana Marcela Vargas	Colombia
Waste	Ms. Maryna Bereznytska	Ukraine
	Mr. Ching Tiong Tan	Malaysia

[1] At the time of publication of this report, Slovakia had not yet submitted its instrument of ratification of the Doha Amendment, and 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.

Area of expertise	*Name*	*Party*
Lead reviewers	Mr. Ricardo Fernandez	
	Ms. Songli Zhu	

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

2. This report contains findings based on the assessment by the ERT of the 2015 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings, and if applicable, the ERT's encouragements to resolve them, are also included.

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

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

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

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

II. Summary and general assessment of the 2015 annual submission

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

[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.

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

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
Dates of submission	Original submission: 10 May 2016 (NIR), 10 May 2016 (version 2 (CRF tables)), 15 April 2016 (SEF tables) Revised submissions: 15 June 2016 (NIR), 15 June 2016 (version 3) and 9 September 2016 (version 4 (CRF tables)) The values from the latest submission are used in this report		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:		
	1. Identification of key categories	Yes	G.6
	2. Selection and use of methodologies and assumptions	Yes	L.18
	3. Development and selection of emission factors	Yes	E.28
	4. Collection and selection of activity data	Yes	A.7, L.1, L.3, L.10
	5. Reporting of recalculations	Yes	E.30
	6. Reporting of a consistent time series	Yes	E.11, E.21, E.29, A.8
	7. Reporting of uncertainties, including methodologies	Yes	L.7
	8. QA/QC	QA/QC procedures were assessed in the context of the national system (see below)	
	9. Missing categories/completeness[b]	Yes	W.9
	10. Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:		
	1. National system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
	2. National registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	3. ERUs, CERs, AAUs and RMUs and on information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR	No	
	4. Matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission	Yes	G.7
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.6
	(c) The Party has reported information in accordance with decision 6/CMP.9	No	
	(d) The Party plans to apply the provisions for natural disturbances to afforestation and reforestation	No	
	(e) The Party plans to apply the provisions for natural disturbances to forest management	No	
	(f) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	NA	
	(g) Other issues	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
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[c] review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

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

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

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

[c] Owing to the timing of the review of the 2015 annual submission, "next" in this context refers to the review of the 2017 annual submission.

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

8. Table 3 compiles all the recommendations made in the previous review report. 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 2015 annual submission and provided the rationale for its determination, taking into consideration the publication date of the previous review report and national circumstances.

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

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	QA/QC and verification (table 3, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines	Improve the QA/QC plan for the energy sector, detailing the improvements planned and the relevant timetable to implement them	Resolved. During the review, the Party referred to the original 2015 NIR (which was replaced by the 2016 NIR[c], see G.4 in table 5 below) and the improvement plan

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			provided to the ERT during the review, which demonstrated the improvements made
G.2	Key category analysis (table 4, 2014) Transparency*	Increase the transparency of reporting on the key category analysis of KP-LULUCF activities	Resolved. Slovakia reported on the key category analysis of KP-LULUCF activities in the 2016 NIR (section 11.6.1) and in CRF table NIR-3
G.3	Inventory planning (table 4, 2014) Transparency*	Include in the NIR the relevant information, provided during the review, for the planning and prioritization of the improvements for the next submission	Not resolved. The 2016 NIR does not include specific information on how results of the key category analysis are used to prioritize inventory improvements
Energy			
E.1	1. General (energy sector) (20, 2014) Transparency*	Provide a much more detailed fuel-specific breakdown of the AD and EFs used to generate emission estimates for petroleum refining and chemicals	Resolved. The methodology used for petroleum refining and chemicals has been changed by the development of a new model, as explained on page 85 of the 2016 NIR and in response to a question raised during the review. See E.24
E.2	1. General (energy sector) (21, 2014) (19, 2013) Transparency*	Provide a brief summary of the national energy balance in the NIR	Not resolved. The information was not provided in the 2016 submission. During the review, the Party provided national energy balance tables. See E.19
E.3	1. General (energy sector) (23, 2014) Transparency*	Provide more detailed explanations of the difference between CO_2 emissions calculated using the sectoral approach with those calculated using the reference approach	Resolved. Explanation is provided on pages 71 and 72 of the 2016 NIR by including information on: the carbon excluded for NEUs; the difference caused by use of the top-down and bottom-up approaches; and the

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			effects of EFs and calorific values
E.4	1. General (energy sector) (23, 2014) Accuracy*	Improve the consistency of reporting and resolve the discrepancies among the three sources of AD for the reference approach	Addressing. It is stated on page 71 of the 2016 NIR that there are ongoing cooperation and discussions among institutions on removing any discrepancies among their statistical systems of energy data (NEIS, SU SR and EU ETS). Furthermore, the Party clarified that NEIS is not used as the source of AD for the sectoral approach in the 2016 submissions (see E.6)
E.5	1. General (energy sector) (23, 2014) Accuracy*	Conduct more detailed analysis of the causes behind the discrepancies between the reference and the sectoral approaches for each individual liquid fuel type and provide the numerical data obtained as a result of such an analysis in the next NIR	Addressing. The discrepancy is explained on page 72 of the 2016 NIR, by stating that the major inconsistencies in the data for liquid fuels are induced by a difference between the bottom-up approach and the statistical energy balance as well as by the differences in EFs and calorific values used. However, the ERT noted that the numerical data are not given by liquid fuel type
E.6	1. General (energy sector) (24, 2014) (22, 2013) Not an issue	Work closely with the SU SR to examine and reduce the significant discrepancies, implementing actions towards the harmonization of data and ensuring that the NEIS data coverage is fully consistent with the NES, and provide adequate and complete explanations in the NIR for any changes undertaken	No longer relevant. As mentioned on page 84 of the 2016 NIR and clarified by the Party during the review, the NEIS database is not used as a source of AD in the 2016 submission. The major sources of AD are SU SR (for non-EU ETS sources) and EU ETS, and NEIS data are used in the QC process of AD,

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			as mentioned on page 92 of the 2016 NIR
E.7	1. General (energy sector) (24, 2014) (18, 2013) Not an issue	Include in the NIR a table presenting a comparison, by fuel type, of fuel consumption data from the NEIS database and from the national statistics	No longer relevant. See E.6
E.8	1. General (energy sector) – biomass (25, 2014) Not an issue	Provide a more detailed description of additives containing water and biofuel that are reported under biofuels	No longer relevant. According to the previous review report, the Party explained that additives containing water and biofuels are reported in the inventory under biofuels. However, the Party clarified during the present review that additives do not contain water and further explained that additives and oxidizing agents are part of fossil gasoline and fossil diesel and are reported in the inventory under these fuels and not under biofuels
E.9	Comparison with international data – (25, 2014) (23, 2013) Not an issue	Increase the transparency of the NIR by explaining any discrepancies between the apparent consumption data reported in the inventory to the UNFCCC, the data from the energy balance of the SU SR and the data reported to IEA	No longer relevant. The ERT acknowledged the comparison of SU SR energy balance and IEA data (included in the original 2015 NIR, annex 3.3) as a QA activity and noted that explaining the differences between the energy balance and IEA data in the NIR is not a mandatory requirement. The ERT also noted that SU SR data are used in the reference approach and that differences between reference and sectoral approaches are elaborated on in the 2016 NIR (section 3.2.2)
E.10	International aviation – liquid fuels – CO_2 (26, 2014)	Provide in the NIR information that the EU ETS is in agreement with the CO_2 emission estimation for domestic aviation performed by	No longer relevant. The Party clarified during the review that the scopes of

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Not an issue	EUROCONTROL	EU ETS and EUROCONTROL data are different
E.11	International aviation – liquid fuels – CO_2, CH_4, N_2O (26, 2014) (24, 2013) Consistency*	Investigate the representativeness of the assumed time trends of fuel consumption share between aviation and international bunker fuels throughout the entire time series	Not resolved. See E.21
E.12	Feedstocks, reductants and other NEU of fuels – liquid, solid and gaseous fuels – CO_2 (27, 2014) Accuracy*	Thoroughly review the feedstocks and NEU of fuels, clearly describe the new methodology and indicate how the stored fraction of carbon is reported in the sectoral approach in the NIR	Resolved. During the review, the Party explained that it has completely revised the estimation and reporting on feedstocks and NEU of fuels according to the 2006 IPCC Guidelines. The ERT noted that the method is described in section 3.2.4 of the 2016 NIR
E.13	Feedstocks, reductants and other NEU of fuels – all fuels – CO_2 (28, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines	Establish new QA/QC routines to govern fuel AD across the inventory, and implement specific AD quality checks to compare the NES data against the sum of AD in the energy and industrial processes sectors for all commodities used as fuels, feedstocks, reductants and other non-energy uses	Addressing. During the review, the Party clarified that new QA/QC processes have been established. However, in 2016 the QA/QC routines for feedstocks and NEU, which are part of a bilateral cooperation between Slovakia and Czechia, were carried out after the NIR and CRF tables were submitted. See also E.22
E.14	1.A. Fuel combustion – sectoral approach – liquid and solid fuels – CO_2, CH_4, N_2O (34, 2014) Accuracy*	Review the reference approach allocations of carbon excluded from petrochemical feedstock use	Resolved. The Party explained during the review that the emission estimation methodology for petroleum refining has been completely modified. Until the 2014 submission the emissions were estimated based on a complex energy and mass balance, which required the estimation of carbon excluded. In the current approach, the emissions are estimated

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			based on combustion data; therefore, the estimation of carbon excluded is no longer necessary
E.15	1.A.1.b Petroleum refining – liquid and solid fuels – CO_2, CH_4, N_2O (29, 2014) Transparency*	Improve transparency regarding the description of the methodology used for estimating emissions from petroleum refining and the estimation and allocation of the associated emissions in the NIR	Addressing. During the review, the Party explained that a new annex 3.2 about petroleum refining was provided in the original 2015 NIR. The ERT noted that the 2015 NIR was resubmitted to be the same as the 2016 NIR, in which the annex was not provided. See E.24
E.16	1.A.1.b Petroleum refining – liquid and solid fuels – CO_2, CH_4, N_2O (31, 2014) Transparency*	Include in the NIR the detailed explanations of the methodological choices and recalculations provided during the review in order to increase the transparency of recalculations	Addressing. The methodological change is explained on page 85 of the 2016 NIR but the ERT considered it was not sufficiently transparent (see E.24 and E.15). For recalculations, see G.4
E.17	1.A. Fuel combustion – sectoral approach – gaseous fuels – CO_2 (37, 2014) Not an issue	Review and analyse the CO_2 EF extrapolation methodology and, if still justified, provide supporting evidence, otherwise revise the CO_2 EF extrapolation methodology and report the details	No longer relevant. The previous review report stated that the CO_2 IEF of natural gas in 1990 was high. The present ERT noted that the IEF of natural gas in 1990 was 56.21 t CO_2/TJ in the 2016 submission (CRF table 1.A(a)), which is close to the default value in the 2006 IPCC Guidelines, volume 2, table 2.2 (56.10 t CO_2/TJ)
E.18	1.B.1.a Coal mining and handling – solid fuels – CO_2 (40, 2014) (17, 2013) Completeness*	Change the notation key from “NO” to “NE”	Resolved. CO_2 emissions are estimated and reported for this category in the 2016 submissions

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
IPPU			
I.1	2. General (IPPU) – (42, 2014) Transparency*	Include more detailed information on recalculations in future NIRs, such as that provided during the review, highlighting all changes since the previous submission	Resolved. The ERT considers that the recalculations were generally adequately explained (e.g. in sections 4.7.9.6 and 4.8.2.6 of the 2016 NIR). See also G.4
I.2	2. General (IPPU) – (44, 2014) Transparency*	Continue to improve the transparency of the NIR, adding details that were provided during the review, for example to clarify national inventory data sources, data flows among organizations (companies, regulators and the inventory agency) and conducting cross-checks with data reported to other systems	Resolved. The ERT considered that the overall description of data sources and data flows is sufficiently transparent in chapter 4 of the 2016 NIR. The limitations in the provided information mostly relate to confidentiality
I.3	2. General (IPPU) – (44, 2014) Transparency*	Systematically review and improve the NIR, ensuring that, for each category, all method details (including source data – AD and EFs, assumptions, extrapolation methods and recalculations – and QA/QC procedures) are clearly described and referenced	Resolved. The ERT considered that the Party provided adequate information on the methodologies used, the sources of AD and EFs, recalculations and QA/QC procedures in chapter 4 of the 2016 NIR
I.4	2. General (IPPU) – (44, 2014) Transparency*	Explain national trends in production, and the derivation of (or extrapolation of) country-specific EFs applied across the time series in the NIR (where possible and without releasing commercially sensitive data)	Resolved. Although the Party did not provide all the information requested in the previous review report (paras. 44(a)–44(d)), the ERT considered that the information provided ensures sufficient transparency
I.5	2. General (IPPU) – (45, 2014) Transparency*	Address the inconsistency identified in reporting emissions from iron and steel by correcting the notation key to "IE"	Resolved. The Party used the notation key "IE" in CRF table2(I).A-Hs2 and provided information on the use of the notation key "IE" in its 2016 NIR

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			(p. 186)
I.6	2.B.2 Nitric acid production – N_2O (46, 2014) Transparency*	Review and simplify the method description and provide clear references for all data sources used to inform EFs and AD, including the details provided to the ERT during the review	Resolved. The ERT considers that the method description, and information on data sources for AD and EFs in the 2016 NIR (pp. 169 and 170) are sufficiently transparent
I.7	2.B.5 Carbide production – CO_2 (47, 2014) Not an issue	Add the information provided to the ERT during the review to future NIRs to improve the transparency of the method and to facilitate quality checking between data in the industrial processes sector and in the energy sector regarding emissions from the NEU of fuels allocated under petroleum coke	No longer relevant. According to the previous review report, the Party explained that petroleum coke was used as the reductant. The Party explained in the original 2015 NIR (section 4.3.6.7) that the QA/QC process had identified that the fuels used in carbide production were coking coal and other bituminous coal instead of petroleum coke
I.8	2.B.5 Carbide production – CO_2 (48, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines	Strengthen the QA/QC activities regarding AD for commodities such as petroleum coke that are used as reductants in the industrial processes sector and are reported under NEU of fuels in the energy sector, and report on progress	Resolved. The Party has implemented QA/QC procedures for this category (2016 NIR, p. 175). Moreover, the Party reported that coking coal and other bituminous coal are used in carbide production instead of petroleum coke (see I.7 above)
I.9	2.C.1 Iron and steel production – CO_2 (49, 2014) Transparency*	Further improve transparency and the description of the carbon balance method in the NIR by clarifying the scope (fuels, materials and source categories) of information presented in the flow diagram provided to the ERT during the review	Resolved. Sufficiently transparent information is provided as annex 4.2 to the 2016 NIR
I.10	2.C.1 Iron and steel production – CO_2 (49, 2014) Transparency*	Add in the NIR the comparison of the GHG inventory and EU ETS emission estimates for integrated steelworks, as provided to the ERT during the review, aggregated across all	Resolved. The Party provided a comparison of the EU ETS and inventory data for the integrated iron and steel

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
		categories used for the GHG inventory	plant as part of QA activities, and includes the result of the comparison in the 2016 NIR (annex 4.2)
I.11	2.C.1 Iron and steel production – CO_2 (50, 2014) Transparency*	Improve the transparency of recalculations in future NIRs by presenting a more detailed explanation of the changes to methods, assumptions, AD and EFs	Resolved. The original 2015 NIR sufficiently described a recalculation in section 4.4.2.1, whereas according to the 2016 NIR (section 4.4.2.6), no recalculation occurred between the original 2015 submission and the 2016 submission. See also G.4
I.12	2.F. Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (51, 2014) Transparency*	Include the clarification provided to the ERT during the review in the NIR and continue to review and improve the time series of emission estimates, using the reported data	Resolved. As explained in the original 2015 NIR (section 4.7), the Party carried out recalculations to improve the time series of emission estimates. Information on the use of the data from the electronic reporting system in the inventory is provided in annex 4.3 to the 2016 NIR
I.13	2.F. Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (51, 2014) Transparency*	Add to the NIR the details provided to the ERT during the review regarding the QA/QC activities applied to the halocarbons and SF_6 estimates in 2011	Resolved. Sufficient information on QA/QC activities is provided in section 4.7.6 of the 2016 NIR
Agriculture			
A.1	3. General (agriculture) (54, 2014) Transparency*	Document the changes in the Nex values used, and report the revised N_2O emissions for the entire time series	Resolved. Slovakia documents in the 2016 NIR (section 5.4.3 and table 5.25) the Nex values used for all animal categories. Slovakia also provides N excretion for the entire time series for all animal categories (table 5.23) and animal manure management systems (table 5.24). N_2O

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			emissions are included in table 5.26 of the 2016 NIR
A.2	3.A Enteric fermentation – CH_4 (55, 2014) Transparency*	Include in the NIR documentation on the use of country-specific data and the methodology used to estimate CH_4 emissions from enteric fermentation, especially an explanation about the regional differences and their implications on GE trends	Addressing. The Party provides in the 2016 NIR (sections 5.2.2–5.2.4) detailed country-specific parameters used for the estimation of CH_4 emissions from enteric fermentation for dairy cattle, non-dairy cattle and sheep. Slovakia also provides the average GE for the entire time series (tables 5.13 and 5.14). However, the 2016 NIR does not include information on how the regional GE estimates are used, or what their implications on GE trends are. During the review, Slovakia explained that there are significant differences in animal breeding practices in different regions, which has been taken into consideration by using regional parameters
A.3	3.B Manure management – CH_4, N_2O (59, 2014) Transparency*	Prepare and report more thorough documentation on Nex for all animal categories	Resolved. Slovakia documents in the 2016 NIR (section 5.4.3 and table 5.25) the Nex values used for all animal categories
A.4	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (61, 2014) (40, 2013) Transparency*	Explain the country-specific methodology in the NIR, especially with regard to the calculation of emissions from N-fixing crops and crop residues	Resolved. Slovakia provides in the 2016 NIR (section 5.7.9) an explanation of the methodologies used for the calculation of emissions from crop residues and N-fixing crops, including cropping areas, N nutritional value in the crops, the amount

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			of harvested residues, the N content of the residues and N fixed by the crops
A.5	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (63, 2014) Accuracy*	Estimate N_2O emissions from agricultural soils considering the revised values of the Nex used in the category manure management	Resolved. Slovakia provides in the 2016 NIR revised N_2O emissions from animal manure applied to soils and nitrogen input per animal manure management system (table 5.31) for the entire time series
A.6	3.G Liming – CO_2 (80, 2014) (47, 2013) Transparency*	Provide explanations and evidence in the NIR that lime application in forests is not practised in Slovakia	Resolved. Slovakia provides this information in the 2016 NIR in relation to afforestation, reforestation and deforestation areas (section 11.3.1.2, p. 409). Additionally, during the review, the Party provided published references and explained that lime application does not occur in forest land given that very acid soils occur only in the upper parts of mountains (most of them included in national parks) and in some regions affected by intensive acid atmospheric deposition, where forests were limed in the 1980s, but the effects were limited. The Party further stated that liming is not allowed without a specific permit
LULUCF			
L.1	4. General (LULUCF) (66, 2014) (44, 2013) Accuracy	Continue the ongoing technical research in order to provide reliable data for estimating carbon stock changes in living biomass, dead organic matter and soil organic matter	Addressing. According to the 2016 NIR (section 6.7.4.5), the research project C-FORLAND (Assessment and modelling of carbon stocks in forest ecosystems for

ID#	Issue and/or problem classification[a,b]	Recommendation made in previous review report	ERT assessment and rationale
			greenhouse gas inventory in landscape) was implemented from July 2012 until December 2015. The Party explained in its improvement plan and during the review that the results of the project related to soils are already used in its 2016 submission, and it plans to generalize the project results regarding other pools (e.g. litter in forest land remaining forest land) and consider them for implementation in the next submission
L.2	4. General (LULUCF) (67, 2014) Accuracy	Use consistently EFs (e.g. BCEF) for estimating carbon gain, loss and/or stock changes in living biomass for forest land and forest land converted to other land-use categories; derive time series weighted mean BCEF values for each species based on age class structure and species composition; and provide in the NIR detailed background data and a clear description of the procedure for calculating the time series weighted mean BCEF values	Resolved. Slovakia uses consistent BCEF values for estimating carbon gain, loss and/or stock changes in living biomass for forest land and forest land converted to other land-use categories. The derivation of timeseries weighted mean BCEF values for each species based on age class structure and species composition is included in the 2016 NIR (section 6.7.2)
L.3	4. General (LULUCF) (68, 2014) (60, 2013) Accuracy	Use default carbon stock values before conversion not only for the annual crops but also for the perennial woody crops, in accordance with table 3.3.2 of the IPCC good practice guidance for LULUCF, for carbon stocks in a range of climate regions for generic perennial woody cropland and considering the area converted from annual crops and perennial woody crops, respectively	Not resolved. In its LULUCF sector improvement plan, provided to the ERT during the review, Slovakia explains that more detailed data are needed to implement this recommendation and that the plan is to implement it in the 2018 submission
L.4	4.A Forest land (69, 2014)	Include information on the average carbon stock of dead wood per hectare in forest land in the	Not resolved. Slovakia does not include in the

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency	NIR	2016 NIR the average carbon stock of dead wood per hectare in forest land
L.5	4. General (LULUCF) (70, 2014) Accuracy	Apply the instant oxidation for carbon stock changes in litter for forest land converted to other land-use categories	Resolved. Slovakia has applied instantaneous oxidation for carbon stock changes in litter in forest land converted to other land-use categories. However, the change in the methodology is not reflected in the 2016 NIR but in the improvement plan. For example, Slovakia continues reporting the use of equation 2.23 in the 2006 IPCC Guidelines (volume 4) for the calculation of annual changes in carbon stocks in litter for land converted to cropland in the 2016 NIR (section 6.8.3.1). See also L.15
L.6	4. General (LULUCF) (71, 2014) (49, 2013) Transparency	Improve the transparency of the reporting by providing a clear description of the process used to estimate the mean value of soil organic carbon stocks in each land-use category and refer to the original data source	Not resolved. Slovakia does not provide in the 2016 NIR a description of the process used to estimate the mean value of soil organic carbon stocks in each land-use category referring to the original data source, but this issue is included in the Party's improvement plan as a potential improvement for the 2017 submission
L.7	4. General (LULUCF) (72, 2014) (48, 2013) Adherence to UNFCCC Annex I inventory reporting guidelines	Conduct the tier 1 uncertainty analyses at the land-use subcategory level	Not resolved. Slovakia does not conduct the approach 1 uncertainty analyses at the land-use subcategory level in the 2016 submission (reported at a more aggregated level in the NIR, annex 3). See L.16

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.8	4. General (LULUCF) (72, 2014) Not an issue	Continue the technical work to increase the transparency of the reporting by providing country-specific uncertainty values at the land-use subcategory level for a tier 2 uncertainty analysis	No longer relevant. The ERT considers that the use of an approach 2 methodology is not mandatory. See L.16
L.9	4.A.1 Forest land remaining forest land – CO_2 (74, 2014) Accuracy	Apply consistent methods for the biomass increment and loss	Resolved. See L.2 above
L.10	4.B.1 Cropland remaining cropland – CO_2 (75, 2014) Accuracy	Estimate and report the carbon stock changes by disaggregating this category into annual cropland converted to perennial woody cropland and perennial woody cropland converted to annual cropland	Not resolved. See L.3 above
L.11	4.B.1 Cropland remaining cropland – CO_2 (76, 2014) Transparency	Include in the NIR an explanation regarding the inter-annual spikes in the removals from cropland remaining cropland	Resolved. The recommended explanation is included in the 2016 NIR (p. 332)
L.12	4.B.1 Cropland remaining cropland – CO_2 (77, 2014) Transparency	Include in the NIR an explanation regarding the use of the notation key "NO" for histosols	Not resolved. The explanation is not included in the 2016 NIR. Slovakia explains in the improvement plan that the total area of organic soil (histosols) represents about 5.5 kha in Slovakia, of which the total area of organic soils for cropland is 2.3 kha (i.e. only 0.16% of cropland), based on geographical analysis. According to the improvement plan, this explanation will be included in the Party's 2017 submission
L.13	4.C.2 Land converted to grassland – CO_2 (78, 2014) (59, 2013) Not an issue	Include in the NIR an explanation regarding the significant inter-annual changes occurring in 1992 and 2000–2001	No longer relevant. The significant inter-annual changes observed for this category in the 2014 annual review report no longer occur, due to a recalculation carried out for the original 2015 submission (original

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			2015 NIR, figure 6.7)
L.14	4(I) Direct N_2O emissions from nitrogen inputs to managed soils –N_2O (79, 2014) (47, 2013) Transparency	Provide explanations and evidence in the NIR that N fertilization in forests is not practised in Slovakia	Resolved. Explanations are included in the 2016 NIR (section 6.13.1)
Waste			
W.1	5. General (waste) – CH_4 (83, 2014) (69, 2013) Accuracy*	Estimate emissions from the period 1990–1996 using the interpolation method for industrial and agricultural waste composition (including the justification that gases leaving anaerobic stabilization are considered as a source of emissions according to air pollution control)	Resolved. Descriptions are given in the 2016 NIR (sections 7.5.2 and 7.8)
W.2	5.A Solid waste disposal on land – CH_4 (84, 2014) Transparency*	Provide more details on the fluctuation in emissions caused by agricultural activities	Resolved. Explanations are given by the Party in the 2016 NIR (section 7.5.2.3). During the review, the Party further explained that agricultural waste is included in official statistics under industrial waste
W.3	5.A Solid waste disposal on land – CH_4 (85, 2014) Transparency*	Correct the reporting error and verify MSW composition data for the entire time series to enhance transparency and consistency	Resolved. The Party corrected the reporting in the 2016 NIR and explains in section 7.5.1.3 that overall MSW balance is used for verification of the AD
W.4	5.A Solid waste disposal on land – CH_4 (86, 2014) Consistency*	Estimate the emissions for the period 1990–1996 using an extrapolation method in accordance with the IPCC good practice guidance and report them in table 8.14 of the NIR	Resolved. A description is given in the 2016 NIR (section 7.5.2.3), and emissions from non-municipal solid waste are given in table 7.4
W.5	5.D Wastewater treatment and discharge – CH_4, N_2O (88, 2014) (71, 2013) Transparency*	Include estimates of emissions from stabilization of sewage sludge or provide documentation to show that these emissions do not occur	Resolved. Documentation is provided in the 2016 NIR (section 7.8)
W.6	5.D Wastewater treatment and discharge – CH_4, N_2O (89, 2014) Transparency*	Provide detailed information on the ISI methodology developed by Fraunhofer ISI (Fraunhofer-Institut für Systemtechnik und Innovationsforschung) to enhance transparency	Resolved. A description is given in the 2016 NIR (section 7.8.2.1)

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
W.7	5.D Wastewater treatment and discharge – CH_4, N_2O (90, 2014) Not an issue	Correct the use of the notation key and strengthen the QA/QC procedures to enhance transparency	No longer relevant. The additional information table where the error occurred is not part of the CRF tables in accordance with the new UNFCCC Annex I inventory reporting guidelines
W.8	5.D Wastewater treatment and discharge – CH_4, N_2O (91, 2014) Transparency*	Provide in the NIR the values for B_o and MCF used for calculating the EF of CH_4 emissions from industrial wastewater discharged into rivers by separate industrial sewers, to enhance transparency	Resolved. Values are given in the 2016 NIR (section 7.8.2.2)
KP-LULUCF			
KL.1	Afforestation and reforestation – CO_2, CH_4, N_2O (96, 2014) Transparency*	Provide information and evidence in the NIR to support the assumption that lime application and N fertilization on lands subject to afforestation and reforestation in the country are not practised	Resolved. Explanations are included in the 2016 NIR (section 11.3.1.2)
KL.2	Afforestation and reforestation –N_2O (97, 2014) Comparability*	Correct the notation key “NA” for N fertilization in the respective KP-LULUCF tables	Resolved. Slovakia uses the notation key “NO” for N fertilization in the KP-LULUCF CRF tables: NIR-1 and 4(KP-II)1
KL.3	Deforestation – CO_2 (99, 2014) Accuracy*	Use the approach proposed for calculating aggregated BCEF values for the emission estimates for deforestation and provide in the NIR detailed background data and a clear description of the procedure used for calculating mean BCEF values	Resolved. As described in the 2016 NIR (section 11.3.1.1), Slovakia corrected the estimations of BCEF values
KL.4	Deforestation – CO_2 (100, 2014) Accuracy*	Enhance the QA/QC procedures on the calculation of carbon stock changes from deforestation	Resolved. The ERT did not identify input errors between the CRF tables and the NIR of the 2016 annual submission
KL.5	Deforestation – CO_2 (101, 2014) Accuracy*	Apply the instant oxidation for carbon stock changes in litter for deforestation	Resolved. See L.5 above and KL.8 in table 5. Slovakia has implemented the recommendation but this is not reflected in the 2016 NIR

Abbreviations: AD = activity data, BCEF = biomass conversion and expansion factor, B_o = maximum methane producing potential, CRF = common reporting format, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, GE = gross energy intake, GHG = greenhouse gas, IE = included elsewhere, IEA = International Energy Agency, 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*, IPCC good practice guidance for LULUCF = *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MCF = methane correction factor, MSW = municipal solid waste, N = nitrogen, NA = not applicable, NE = not estimated, NEIS = National Emission Information System, NES = national energy statistics, NEU = non-energy use, Nex = nitrogen excretion rate, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, SU SR = Statistical Office of the Slovak Republic, 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", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

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

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

[c] Any reference to the 2016 submission in this table refers to the 2016 submission of the Party, which the Party has indicated constitutes a submission under the Convention for the year 2016, a resubmission under the Convention for the year 2015 and a submission under the Kyoto Protocol for the years 2015 and 2016.

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 2015 annual submission of Slovakia, and have not been addressed by the Party.

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

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
General		
	No such general issues were identified	
Energy		
E.2	Provide a brief summary of the national energy balance in the NIR	3 (2013–2015/2016)
E.11	Investigate the representativeness of the assumed time trends of fuel consumption share between aviation and international bunker fuels throughout the entire time series	3 (2013–2015/2016)
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
	No such issues for the agriculture sector were identified	

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
LULUCF		
L.1*	Continue the ongoing technical research in order to provide reliable data for estimating carbon stock changes in living biomass, dead organic matter and soil organic matter	3 (2013–2015/2016)
L.3*	Use default carbon stock values before conversion not only for the annual crops but also for the perennial woody crops, in accordance with table 3.3.2 of the IPCC good practice guidance for LULUCF, for carbon stocks in a range of climate regions for generic perennial woody cropland and considering the area converted from annual crops and perennial woody crops, respectively	3 (2013–2015/2016)
L.6	Improve the transparency of the reporting by providing a clear description of the process used to estimate the mean value of soil organic carbon stocks in each land-use category and refer to the original data source	3 (2013–2015/2016)
L.7	Conduct tier 1 uncertainty analyses at the land-use subcategory level	3 (2013–2015/2016)
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance for LULUCF = *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report.

[a] An asterisk is included after any issue ID# where the underlying issue is related to accuracy or completeness of a key category, a missing category or a potential key category, as indicated in decision 13/CP.20, annex, paragraph 83.

V. Additional findings made during the 2015 technical review

10. Table 5 contains findings made by the ERT during the technical review of the 2015 annual submission of Slovakia that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2015 technical review of the annual submission of Slovakia

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
General			
G.4	Recalculations	The Party submitted its original 2015 NIR under the Convention on 13 November 2015. On 10 May 2016, the Party resubmitted its 2016 submission indicating that its official inventory submission of 2016 constitutes a submission under the Convention for the year 2016, a resubmission under the Convention for the year 2015 and a submission under the Kyoto Protocol for the years 2015 and 2016. The ERT noted that the 2016 submission contains only information on recalculations between the original 2015 submission and the 2016 submission, and that information on the full extent of recalculations between the 2014 submission and the final 2015 submission are not included. The ERT concludes that the reporting is not transparent but noted that this situation is related to the unique circumstances referred to in paragraph 6 above	Not an issue
G.5	NIR	The ERT identified transparency issues for the general, energy, LULUCF and waste sectors, as reflected in table 3 above and in this table. Several transparency issues from the previous review report remain unresolved (G.3, E.2, L.4) The ERT recommends that Slovakia improve the transparency of its NIR and report on the actions taken in the NIR	Yes. Transparency*
G.6	Key category analysis	The reporting on key category analysis is not transparent. In particular, in annex 1 to the 2016 NIR[c] Slovakia stated that the key category analysis according to approach 1 (2006 IPCC Guidelines) is done by the CRF Reporter. However, the ERT considered that this is not sufficient in particular as the CRF Reporter software does not present the key category analyses excluding LULUCF. During the review, Slovakia provided the calculation files that allowed the ERT to assess the methodological approach applied in Slovakia's key category analysis. This assessment confirmed that the analysis was carried out both with and without LULUCF, in accordance with UNFCCC Annex I inventory reporting guidelines The ERT recommends that Slovakia include in the NIR information on the methodological approach applied for the key category analysis, to justify that the analysis is carried out both with and without LULUCF, in accordance with UNFCCC Annex I inventory reporting guidelines	Yes. Transparency*
G.7	Article 3, paragraph 14, of	In its 2016 annual submission, Slovakia reported information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, but did	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
	the Kyoto Protocol	not identify the changes in its reporting compared with that in its previous annual submission, in accordance with decision 15/CMP.1. During the review, Slovakia stated that no changes had occurred The ERT recommends that Slovakia include, in the NIR, information on any changes in its information provided in accordance with Article 3, paragraph 14, of the Kyoto Protocol	
G.8	Inventory planning	The 2016 NIR, in section 1.2.9 "Changes in the national inventory arrangements" includes a reference to a comprehensive national improvement plan, with the further indication that this plan is established with all relevant contributors of the national inventory system and that the national improvement plan describes the existing problems by category, includes the potential improvements and evidence of implementation and identifies the level of priority associated with each (high, medium or low). However, this plan is not contained in the 2016 NIR. During the review, the Party provided the improvement plan The ERT encourages the Party to include the annual improvement plan in its NIR to improve transparency	Not an issue
Energy			
E.19	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O	The previous review recommendation (see E.2) that the Party provide a brief summary of the national energy balance in the NIR was not implemented in the 2016 submission. The present ERT further noted that the national energy balance is essential for the transparency of the annual submission The ERT recommends that Slovakia include the full national energy balance for the most recent inventory year in its NIR	Yes. Transparency*
E.20	Fuel combustion – reference approach – other fossil fuels, peat – CO_2	The overall discrepancy between CO_2 emissions reported under the reference approach and the sectoral approach was 0.81% in 2014 (0.16% in 2013). The apparent energy consumption for other fossil fuels (including MSW and ISW incineration with energy recovery and energy use of CH_4 from coal mines) in the reference approach, 4.23 PJ in 2014 (3.51 PJ in 2013) was 3.26% higher in 2014 (2.75% higher in 2013) than in the sectoral approach, whereas for CO_2 emissions, the difference was 58.88% in 2014 (65.59% in 2013). In addition, Slovakia reports, in the reference approach, apparent energy consumption and CO_2 emissions of peat as not occurring ("NO"), whereas in the sectoral approach, energy consumption (0.26 PJ in 2014, 0.59 PJ in 2013) and CO_2 emissions (27.16 kt in 2014 and 62.21 kt in 2013) are reported. During the review, the Party explained that the differences regarding "other fossil fuels" were due to differences in data being reported by SU SR (used	Yes. Accuracy*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		in the reference approach) and the EU ETS (used in the sectoral approach). In the sectoral approach, the information from EU ETS reports allows the separation of fossil and biogenic carbon in incinerated ISW. The Party explained that discussions are ongoing to improve the national statistics on incinerated waste in the energy balance. The consumption of peat has not been covered by SU SR and is therefore not included in the reference approach, whereas it is covered by the bottom-up data from the EU ETS, which are used in the sectoral approach The ERT recommends that the Party examine the data and reduce discrepancies between the reference and sectoral approaches to the extent possible and report the outcome of such research in the NIR	
E.21	International aviation – jet kerosene and aviation gasoline – CO_2, CH_4 and N_2O	The methodology used to allocate the fuel consumption between international aviation and domestic aviation is different for the time periods of 1990–2004 and 2005–2014 (see E.11). According to the 2016 NIR (section 3.2.3.1), for the former period, expert judgment is used, assuming that 90% of jet kerosene and 10% of aviation gasoline was used in international aviation. For the later period, EUROCONTROL data on the number of flights, fuel consumption and division of domestic and international flights were used. The ERT noted an inconsistency in the time series regarding the allocation of fuel between domestic and international aviation. For 2005–2014, the share of aviation fuel allocated to international aviation was from 92.7% to 96.9%, being the lowest in 2008 and highest in 2013. For 1990–2004, fuel allocated to international aviation was about 90% (89.09% in 1990). Furthermore, the ERT noted a step change in jet kerosene consumption reported for international aviation when the methodology was changed (from 1 062.70 TJ in 2004 to 1 941.93 TJ in 2005), whereas for domestic aviation, such a step change was not observed (118.08 TJ in 2004 and 115.12 TJ in 2005) The ERT recommends that the Party, when investigating issue E.11 on distribution of fuel use between domestic and international aviation, consider whether the newly available EUROCONTROL data for 2005–2014 could be used to inform the expert judgment used for 1990–2004, or alternatively, include an explanation on the fluctuation of fuel allocation between domestic and international aviation in the NIR	Yes. Consistency*
E.22	Feedstocks, reductants and other NEU of fuels – liquid fuels –	See E.13 The ERT recommends that the Party include the information on its QA/QC system for feedstocks and NEU in the NIR	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
	CO_2		
E.23	1.A.1.a Public electricity and heat production – other fossil fuels – CO_2, CH_4 and N_2O	The ERT noted that there is lack of transparency in the 2016 NIR (p. 83) regarding whether emissions from waste incineration with energy recovery are reported under the energy sector or the waste sector. During the review, the Party explained that emissions from MSW incineration and part of the emissions from ISW incineration with energy recovery are reported in the subcategory other (public electricity and heat production) (1.A.1.a.iv). This subcategory also includes emissions from energy use of CH_4 from coal mines. Furthermore, emissions from industrial waste incinerated in cement plants are reported in the category non-metallic minerals (1.A.2.f) The ERT recommends that the Party provide, in the NIR, a more transparent and structured description on what is reported as 'other fossil fuels' under the subcategories public electricity and heat production – other (1.A.1.a.iv) and non-metallic minerals (1.A.2.f) and their linkages with reporting in the waste sector (5.C)	Yes. Transparency*
E.24	1.A.1.b Petroleum refining – liquid fuels – CO_2, CH_4 and N_2O	The previous review report included several recommendations (see E.1 and E.14–E.16) to improve the transparency and accuracy of estimates for petroleum refining. During the present review, the Party clarified that the methodology used has been changed since its 2014 submission. As Slovnaft is the only operator in this subcategory, a tier 3 method is used by creating a model at the plant level. The model was jointly prepared by energy and IPPU experts to eliminate double counting, underestimation or discrepancies with the 2006 IPCC Guidelines. Further, based on the 2006 IPCC Guidelines, process emissions from ethylene production have been reallocated to petrochemical and carbon black production – ethylene (2.B.8.b) and emissions from hydrogen production to other (chemical industry) (2.B.10). However, the ERT noted that the detailed information on the new methodology was only available in the original 2015 NIR (annex 3.2) of 13 November 2015, and that it is not available in the 2016 submission, which was used to replace the original 2015 submission (see G.4 above) The ERT recommends that the Party provide detailed methodological information on petroleum refining in the NIR. The ERT notes that such methodological information could be based on annex 3.2 to the original 2015 NIR of 13 November 2015	Yes. Transparency*
E.25	1.A.1.c Manufacture of solid fuels and other energy	The 2016 NIR states (p. 61) that this subcategory covers coke production, coal manufacturing and charcoal production. During the review, the Party clarified that the scope of this subcategory in fact is coke production, fuel own-use in coal mines and fuel own-use in oil and gas companies, and that the category does not include charcoal production or coal	Yes. Comparability*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
	industries – all fuels – CO_2, CH_4 and N_2O	manufacturing. The Party further clarified during the review that coal manufacturing does not occur in Slovakia. Fugitive emissions from charcoal production are reported under the category solid fuel transformation (1.B.1.b), based on the FAO database (reported by the Ministry of Agriculture). However, based on information from Eurostat and IEA there were no production or consumption of charcoal in Slovakia in 2014. Therefore, the Party considers that charcoal is produced by agricultural farms and emissions (if existing) are included in the category agriculture/forestry/fishing – stationary (1.A.4.c.i)	
		The ERT recommends that, in accordance with the 2006 IPCC Guidelines (volume 2, p. 2.8), the Party report the emissions from coke production under manufacture of solid fuels (1.A.1.c.i), and report own-energy-use emissions from coal mines, oil and gas companies and possible emissions from charcoal production under other energy industries (1.A.1.c.ii), if they can be disaggregated from agriculture/forestry/fishing – stationary	
E.26	1.A.2.a Iron and steel – solid fuels – CO_2, CH_4 and N_2O	The ERT noted that a carbon balance diagram for iron and steel production is provided on page 247 of the 2016 NIR. The ERT commends the Party for this. According to the diagram, some of the emissions are reported under subcategory 1.A.2.m. However, no information about emissions from subcategory 1.A.2.m is provided in the 2016 NIR or in CRF table 1.A(a)s2. During the review, the Party clarified that the correct category on the diagram is manufacturing industries and construction – other – other (1.A.2.g.viii)	Yes. Transparency*
		The ERT recommends that the Party revise the carbon balance diagram for iron and steel production in its NIR by replacing the reference to 1.A.2.m with 1.A.2.g.viii	
E.27	1.A.3.b Road transportation – liquid fuels – CO_2	The ERT noted that it is stated on page 109 of the 2016 NIR that EFs are calculated automatically by the COPERT IV model based on input parameters such as the average speed, the quality of fuels, the age of vehicles, the weight of vehicles and the volume of cylinders. During the review, the Party clarified that the CO_2 EFs for gasoline and diesel oil used in road transportation are based on country-specific carbon content, which was measured in the laboratories of the Slovak refinery in 2011	Yes. Transparency*
		The ERT recommends that the Party explain in the NIR that the CO_2 EFs for gasoline and diesel oil used in the road transportation are based on country-specific carbon content, which was measured in the laboratories of the Slovak refinery in 2011, and provide country-specific NCVs, carbon contents and EFs of gasoline and diesel oil used in road transportation in the NIR, preferably in tabular format	
E.28	1.A.3.c Railways –	The CO_2 IEFs of diesel (75.01–75.85 t/TJ) for railways reported by Slovakia are the highest of the Annex I Parties in the whole time series, and are also above the range of default	Yes. Accuracy*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
	diesel – CO_2	values in the 2006 IPCC Guidelines, volume 2, table 3.4.1 (72.60–74.80 t/TJ). During the review, the Party explained that the high IEF was caused by applying the EF using the physical unit from the Revised 1996 IPCC Guidelines (3 188 kg/t fuel, in table 1-47 on p. 1.89 in volume 3) and a country-specific NCV (for example, 42.04 TJ/Gg in 2014). The ERT considered that it is not appropriate to use default data from the Revised 1996 IPCC Guidelines and the Party acknowledged that. During the review, the Party provided a calculation of the emissions using the default CO_2 EF from the 2006 IPCC Guidelines. The ERT noted that in this calculation, the emissions in 1990, 2013 and 2014 were 4.48, 1.92 and 1.78 kt CO_2 lower than in the Party's 2016 submission, respectively. The ERT noted that the impact of the change was below the threshold of significance included in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and therefore did not include this issue in the list of potential problems The ERT recommends that the Party convert the AD (amount of fuel used) from mass units to energy units by using the country-specific NCV, and then adopt the default EF from the 2006 IPCC Guidelines, volume 2, table 3.4.1 (74.10 t CO_2/TJ) to calculate CO_2 emissions from railways. The ERT also encourages the Party to develop a country-specific CO_2 EF for diesel for this category	
E.29	1.A.3.e.ii Other (other transportation) – CO_2	According to the 2016 NIR (p. 117), the CO_2 emissions from urea-based catalysts were estimated using the COPERT model for heavy-duty trucks for the year 2014 and reported under other transportation – other (1.A.3.e.ii). The emissions for the years 2010–2013 were included in road transportation (heavy-duty trucks and buses) (1.A.3.b.iii). In response to a question raised by the ERT concerning time series consistency, the Party clarified that emissions from urea-based catalysts were also calculated using the COPERT model for the years 2010–2013, but they could not be separated from the total emissions of road transportation, and were therefore reported in the road transportation category. The Party further explained that the separation of emissions from fuel combustion and urea-based catalysts is part of the calibration of the model at the beginning of calculation and therefore it needs to be run again for every single year The ERT recommends that the Party estimate CO_2 emissions from urea-based catalysts for the entire time series to improve time series consistency. Furthermore, the ERT recommends that the Party report these emissions under the category non-energy products from fuels and solvent use – other (2.D.3)	Yes. Consistency*
E.30	1.A.4 Other sectors	The 2016 NIR (p. 126) explains a recalculation carried out for the 2013 emissions for this category, resulting in a decrease of CO_2 emissions by 299.33 kt compared with that in the	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
	– all fuels – CO_2	original 2015 submissions (see G.4 above), which accounts for 0.70% of the total GHG emissions excluding LULUCF. The reasons are briefly explained on page 126 and in table 10.3 of the 2016 NIR, namely, revision of the energy balance, reallocation of liquefied petroleum gas and correct categorization of lignite and other bituminous coal. During the review, the Party further explained that, according to the timeline of national inventory planning, the inventory is prepared in January. Therefore, any revision of the preliminary energy balance, which is usually also released in January, cannot be incorporated into the inventory until the next year The ERT recommends that the Party explain, in the NIR, the process of the energy balance revision and its impact on emission estimates, in cases where recalculations are carried out because of the revision of the energy balance	
E.31	1.B.2.b Natural gas – Gaseous fuels – CH_4	Fugitive CH_4 emissions from natural gas is a key category. The Party uses the tier 1 method for this category, as indicated in table 3.4 of the 2016 NIR (p. 63). During the review, the Party clarified that direct measurements are done annually by the operator (SPP); however, currently the quality of measurements could not be guaranteed. Therefore, the Party decided to use the tier 1 method The ERT recommends that the Party move to a higher tier approach, in accordance with the decision tree of the 2006 IPCC Guidelines, volume 2, figure 4.2.1	Yes. Accuracy*
IPPU			
I.14	2.G.1 Electrical equipment – SF_6	Slovakia reported information on SF_6 emissions from both electrical equipment and window insulation under “electrical equipment” (CRF table 2(II)B-Hs2 and 2016 NIR section 4.8.2) although disaggregated data are available. During the review, Slovakia explained that SF_6 emissions from window insulation are negligible compared with those from electrical equipment (only represented 0.09% of total SF_6 emissions in 2014). As the production of windows stopped in 2002, the Party considered it unfeasible to report disaggregated emissions The ERT accepts the explanation provided by Slovakia but recommends that the Party use notation key “IE” for window insulation, and explain in CRF table 9 that emissions are included under “electrical equipment”. The ERT further recommends that the Party explain in the NIR that SF_6 emissions from window insulation are negligible compared with those from electrical equipment (only represented 0.09% of total SF_6 emissions in 2014) and that because the production of windows stopped in 2002, the Party considered it unfeasible to	Yes. Comparability*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		report disaggregated emissions	
Agriculture			
A.7	3. General (agriculture) – N_2O	Slovakia used country-specific annual Nex values to estimate N_2O emissions from manure management for non-dairy cattle in 2014 (tier 2 methodology), while for 1990–2013 it used default values derived according to the 2006 IPCC Guidelines, volume 4, equation 10.30 (tier 1 methodology). The ERT concluded that the estimation of N_2O emissions was not consistent throughout the time series, potentially leading to an overestimation of emissions in the base year for non-dairy cattle, given that the default value used for 1990 (60 kg N/head/year) was 53.0% higher than the country-specific Nex value derived for this animal category (39.23 kg N/head/year) for 2014. During the review, Slovakia indicated that it used a country-specific Nex value only in 2014, owing to the lack of AD for non-dairy cattle for previous years. Additionally, during the review week, Slovakia submitted revised CRF tables, including revised estimates for direct and indirect N_2O emissions for non-dairy cattle for 1990–2013 using a constant country-specific Nex value of 39.23 kg N/head, which is based on an average animal weight of 302.91 kg. The Party also revised the estimates of direct and indirect N_2O from agricultural soils accordingly. The ERT agrees with the revised estimates, which decreased the 1990 emissions by 82.11 kt CO_2 eq for manure management and by 150.42 kt CO_2 eq for agricultural soils. However, the ERT considers that the use of AD that take into consideration the development of animal weights over the time series would further improve the accuracy of the estimates The ERT recommends that Slovakia estimate country-specific Nex values for the complete time series, taking into consideration the development of animal weights, if appropriate, and recalculate the time series of N_2O emissions from manure management and agricultural soils accordingly	Yes. Accuracy*
A.8	3. General (agriculture) – N_2O	Slovakia used country-specific annual Nex values to estimate N_2O emissions from manure management for dairy cattle and sheep in 2014, whereas default values were used for 1990–2013. The Nex values for 2014 were 4.4% higher for dairy cattle and 14.3% higher for sheep than in the rest of the time series. The ERT noted that the approach led to inconsistent time series and that the emissions from manure management, and direct and indirect N_2O from agricultural soils in 2013 were potentially underestimated. During the review week, the Party provided emission estimates for manure management of dairy cattle and sheep using the Nex value of 2014 for 1990–2013. The ERT noted that the impact of the use of the 2014 Nex for 2013, when considering manure management and direct and indirect N_2O from agricultural soils, was below the threshold in paragraph 37(b) of the UNFCCC Annex I	Yes. Accuracy*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		inventory reporting guidelines and therefore did not include this issue in the list of potential problems	
		The ERT recommends that Slovakia elaborate country-specific Nex rates for the entire time series for dairy cattle and sheep in accordance with the decision tree in the 2006 IPCC Guidelines, volume 4, figure 10.4. The ERT further recommends that Slovakia include in the NIR a description of calculations carried out to derive the country-specific Nex values for dairy cattle and sheep	
LULUCF			
L.15	4. General (LULUCF)	See L.5	Yes. Transparency
		The ERT recommends that Slovakia include in the NIR a description of how instantaneous oxidation for carbon stock changes in litter for forest land converted to other land-use categories was implemented	
L.16	4. General (LULUCF)	See L.7 and L.8. According to Slovakia's improvement plan, implementation of an approach 2 uncertainty assessment for the LULUCF sector using the Monte Carlo method is planned for the 2018 submission	Not an issue
		The ERT encourages Slovakia to implement the planned improvement to carry out an approach 2 uncertainty assessment for the LULUCF sector	
L.17	4 (V) Biomass burning – CO_2	To estimate CO_2 emissions from biomass burning, Slovakia uses default parameters from tables 2.4, 2.5 and 2.6 of the 2006 IPCC Guidelines (volume 4), instead of using country-specific values derived from the NFI. During the review, the Party explained that the NFI data may have limited applicability because fire areas are usually small and assumed to occur in the border of forests. Therefore, the NFI data are not representative of these particular fire areas, and use of NFI data might increase the uncertainty of the estimates	Not an issue
		The ERT encourages Slovakia to explain in the NIR why it considers that use of NFI data would not improve accuracy of the estimates from biomass burning	
L.18	4.A.2 Land converted to forest land – CO_2	To estimate net changes in carbon content in the living biomass and deadwood in the conversion from other land uses to forest land, Slovakia uses the tier 1 method and equation 2.7 from the 2006 IPCC Guidelines. During the review, Slovakia explained that, for conversion of cropland and grassland to forest land, the changes in living biomass and deadwood are assumed to be zero at conversion because, according to common afforestation practices, if any vegetation exists in cropland or grassland it is not removed before	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		conversion to forest land and remains in afforested areas. Slovakia did not provide evidence to support this assumption The ERT recommends that Slovakia provide, in the NIR, a justification to support the assumption that, according to common afforestation practices, if any vegetation exists in cropland or grassland, it is not removed before conversion to forest land. If such justification cannot be provided, the ERT recommends that the Party revise its methodology to take into consideration changes in living biomass and deadwood following the land-use change	
Waste			
W.9	5.A Solid waste disposal on land – CH_4	Slovakia reports in CRF table 5.A the annual amount of waste disposed at SWDSs (1 383.44 kt in 2013 and 1 323.70 kt in 2014). During the review, the ERT asked Slovakia to explain in a transparent manner how the Party receives the amount of waste disposed at SWDSs using numbers and tables from the statistical report on waste in Slovakia, which is the main source of AD (2016 NIR, p. 364). The Party noted in its response that non-MSW waste groups 17–19 (construction and demolition wastes; wastes from human or animal health care or related research; wastes from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use) were not included in the emission estimates. During the review, the Party provided a draft calculation of the emissions from waste categories 17–19. The ERT noted that the share of the excluded emissions was 0.006% of the national total emissions excluding LULUCF. The ERT further noted that this share was below the threshold in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and therefore did not include this issue in the list of potential problems The ERT recommends that the Party improve the completeness of its submission by including in its inventory emissions from the landfilling of the waste categories 17–19, as provided during the review week, for the entire time series	Yes. Completeness*
W.10	5.D Wastewater treatment and discharge – CH_4	The ERT noted that the information in the 2016 NIR (section 7.8.1) on domestic wastewater treatment is not supported by references. In response to a request from the ERT, Slovakia provided an article by Bodik and Kubaska (2013) The ERT recommends that the Party include the article by Bodik and Kubaska (2013) in the reference list of the related NIR chapter	Yes. Transparency*
W.11	5.D Wastewater treatment and	In CRF table 5.D of the 2016 annual submission Slovakia reported the amount of sludge removed (28.72 kg DC in 2013 and 28.44 kg DC in 2014). The ERT noted that the Party did	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
	discharge – CH_4	not provide, in its annual submission, any information on the share of sludge applied to agricultural soils, sludge incinerated and sludge deposited to SWDSs or any references for this information. During the review, the Party provided links to reports with the required information	
		The ERT recommends that the Party include the information on the data sources regarding the share of sludge applied to agricultural soils, sludge incinerated and sludge deposited to SWDSs in the NIR, or in the documentation box of CRF table 5.D	
KP-LULUCF			
KL.6	Forest management – general	According to decision 2/CMP.7, annex, paragraph 14, Parties shall demonstrate methodological consistency between the FMRL and reporting for forest management. Decision 2/CMP.7, annex, appendix, presents two different FMRL values for Slovakia corresponding to the two methodological options: 358 kt CO_2 eq assuming instantaneous oxidation of HWP and –1 084 kt CO_2 eq applying a first-order decay function for HWP. In the 2016 NIR, Slovakia mentions that in forest land remaining forest land under the Convention and for forest management under Article 3, paragraph 4, of the Kyoto Protocol, for estimating emissions for HWP, the production approach was applied based on domestic harvest, using AD from the FAO database on forestry production and trade to derive production data from 1961 to 2013, which the ERT considers as a set of transparent and verifiable data to implement paragraph 29 of decision 2/CMP.7 (i.e. the approach applies a first-order decay function for HWP). However, the ERT noted that, in CRF table 4(KP-I)B.1.1, the FMRL value reported is 358 kt CO_2 eq corresponding to an FMRL assuming instantaneous oxidation of HWP. During the review, the Party explained that a technical correction to the FMRL is planned for the next submission	Yes. Accuracy *
		The ERT recommends that the Party make the improvements required to ensure methodological consistency between the FMRL and the reporting of emissions and removals from forest management, particularly in the methodological approach to estimate the contribution of HWP, including the application of a technical correction to the FMRL	
KL.7	Forest management – general	According to the 2016 NIR (p. 412), all forest land is considered as managed and all areas of forest land remaining forest land are subject to forest management activity in Slovakia. For the year 2014 (and 2013), the ERT noted that the area reported under LULUCF – forest land remaining forest land (CRF table 4.A) is 0.85 kha higher (0.29 kha higher in 2013) than the area under forest management (CRF table 4(KP-I)B.1). During the review, the Party explained that this is because of the 20-year transition period for land afforested prior to 1990. Under LULUCF, areas afforested prior to 1990 have been included in forest land remaining forest land since 2010, whereas lands under afforestation remained under	Yes. Transparency *

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		afforestation and did not move to forest management The ERT recommends that the Party explain in the NIR that area reported under LULUCF "forest land remaining forest land" is higher than the area under forest management because under LULUCF, areas afforested prior to 1990 are included in forest land remaining forest land since 2010, whereas lands under afforestation remained under afforestation and did not move to forest management	
KL.8	Deforestation	See KL.5 The ERT recommends that the Party include in the NIR a description of how it implemented instantaneous oxidation for carbon stock changes in litter in areas subject to deforestation	Yes. Transparency*

Abbreviations: AD = activity data, CRF = common reporting format, DC = degradable organic component, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, FAO = Food and Agriculture Organization of the United Nations, FMRL = forest management reference level, GHG = greenhouse gas, HWP = harvested wood products, IE = included elsewhere, IEA = International Energy Agency, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, ISW = industrial solid waste, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MSW = municipal solid waste, NCV = net calorific value, NEU = non-energy use, Nex = nitrogen excreted, NFI = national forest inventory, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, Revised 1996 Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, SU SR = Statistical Office of the Slovak Republic, SWDS = solid waste disposal site, 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", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

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

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

[c] Any reference to the 2016 submission in this table (except in G.4) refers to the 2016 submission of the Party, which the Party has indicated constitutes a submission under the Convention for the year 2016, a resubmission under the Convention for the year 2015 and a submission under the Kyoto Protocol for the years 2015 and 2016.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2015 annual submission of Slovakia.

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

12. Slovakia has elected commitment period accounting and therefore the issuance and cancellation of units for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are not applicable for the 2015 review.

VIII. Questions of implementation

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

Annex I

Overview of greenhouse gas emissions and removals for Slovakia for submission year 2015 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

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

Table 6
Total greenhouse gas emissions for Slovakia, base year[a]–2013[b]
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								358.00
Base year	65 280.26	74 271.51	65 280.26	74 271.51	NA		NA	
1990	65 280.26	74 271.51	65 280.26	74 271.51				
1995	45 121.45	54 405.58	45 121.45	54 405.58				
2000	39 993.57	49 712.48	39 993.57	49 712.48				
2010	40 470.26	46 482.87	40 470.26	46 482.87				
2011	39 194.94	45 604.02	39 194.94	45 604.02				
2012	35 553.92	43 175.59	35 553.92	43 175.59				
2013	34 721.19	42 792.48	34 721.19	42 792.48		–400.03	NA	–6 859.20

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

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, and 2000 for NF_3. Slovakia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

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

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

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

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

Table 7
Greenhouse gas emissions by gas for Slovakia, excluding land use, land-use change and forestry 1990–2013[a]
(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	61 837.57	7 121.28	4 997.74	NO	314.86	NO	0.06	NO
1995	44 679.54	6 132.91	3 439.84	10.49	132.65	NO	10.15	NO
2000	41 155.01	5 422.74	3 022.05	84.73	14.91	NO	13.04	NO
2010	38 385.94	4 707.52	2 815.09	529.68	25.01	NO	19.62	NO
2011	37 880.85	4 788.51	2 371.89	521.86	20.11	NO	20.80	NO
2012	35 867.90	4 408.50	2 322.24	530.05	25.66	NO	21.24	NO
2013	35 395.15	4 555.87	2 274.15	535.19	9.81	NO	22.30	NO
Per cent change 1990–2013	**–42.8**	**–36.0**	**–54.5**	**NA**	**–96.9**	**NA**	**38 111.7**	**NA**

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

Table 8
Greenhouse gas emissions by sector for Slovakia, 1990–2013[a,b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	56 572.15	9 813.65	6 421.00	–8 991.25	1 464.71	NO
1995	39 470.07	9 377.21	4 137.91	–9 284.13	1 420.39	NO
2000	36 442.08	8 556.01	3 270.52	–9 718.90	1 443.87	NO
2010	32 597.94	9 519.04	2 867.57	–6 012.61	1 498.33	NO
2011	32 094.92	9 102.71	2 875.20	–6 409.08	1 531.19	NO
2012	29 635.00	9 019.52	2 956.86	–7 621.67	1 564.20	NO
2013	29 474.16	8 717.92	3 049.94	–8 071.29	1 550.45	NO
Per cent change 1990–2013	**–47.9**	**–11.2**	**–52.5**	**–10.2**	**5.9**	**NA**

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

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

[b] Slovakia did not report indirect CO_2 emissions in common reporting format table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a,b]–2013, for Slovakia

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[c]	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				358.00				
Technical correction				NA				
Base year	NA				NA	NA	NA	NA
2013		–443.07	43.04	–6 859.20	NA	NA	NA	NA
Per cent change base year–2013					**NA**	**NA**	**NA**	**NA**

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

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, and 2000 for NF_3. Slovakia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Values in this table include emissions on lands subject to natural disturbances, if applicable.

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

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

Table 10
Key relevant data for Slovakia under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) Forest management: commitment period accounting
	(d) Cropland management: not elected
	(e) Grazing land management: not elected
	(f) Revegetation: not elected
	(g) Wetland drainage and rewetting: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	No
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	2 599.503 kt CO_2 eq (20 796.023 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. Afforestation and reforestation in 2013	NA
2. Deforestation in 2013	NA
3. Forest management in 2013	NA
4. Cropland management in 2013	NA
5. Grazing land management in 2013	NA
6. Revegetation in 2013	NA
7. Wetland drainage and rewetting in 2013	NA

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

Annex II

Information to be included in the compilation and accounting database

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

Table 11
Information to be included in the compilation and accounting database for 2013, including the commitment period reserve, for Slovakia
($t CO_2 eq$)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	182 042 046			182 042 046
Annex A emissions for 2013				
CO_2	35 395 155			35 395 155
CH_4	4 555 868			4 555 868
N_2O	2 335 802	2 274 150		2 274 150
HFCs	535 192			535 192
PFCs	9 810			9 810
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	22 303			22 303
NF_3	NO			NO
Total Annex A sources	**42 854 131**	**42 792 479**		**42 792 479**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–443 068			–443 068
3.3 Deforestation	43 036			43 036
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management for 2013	–6 859 197			–6 859 197

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

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The category for which methods are included in the *2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories* was reported as "NE" (not estimated) or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory is the following:

Methane from solid waste disposal on land (5.A) (see W.9 in table 5 above).

Annex IV

Documents and information used during the review

A. Reference documents

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

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

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

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

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

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

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories". Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=4>.

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

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf#page=6>.

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

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, Part II: Implications related to review and adjustments and other related issues". Decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=30>.

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

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

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

Standard independent assessment report, part 1, for Slovakia for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_svk_1_2.pdf>.

Standard independent assessment report, part 2, for Slovakia for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_svk_2_2.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Szemesová (Slovak Hydrometeorological Institute), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Slovakia:

Jusková, M., Vlašičová, E., Szemesová, J., Drábik, A. 2009. *PRÍRUČKA KVALITY SLOVENSKÉHO HYDROMETEOROLOGICKÉHO ÚSTAVU pre Národný inventarizačný systém emisií skleníkových plynov podľa článku 5 Kjótskeho protokolu.* (Quality Manual of Slovak Hydrometeorological Institute, National Inventory System for Greenhouse Gas Emissions in Accordance with Article 5 of the Kyoto Protocol)

Bodik, I. and Kubaska, M. 2013. *Municipal Sewage Sludge Management in the Slovak Republic—Actual Status and Perspectives* Bratislava, Slovakia, Journal of Residuals Science & Technology, Vol. 10, No. 4—October 2013.

[1] Reproduced as received from the Party.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
BCEF	biomass conversion and expansion factor
B_o	maximum methane producing potential
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DC	degradable organic component
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
FM	forest management
FMRL	forest management reference level
GE	gross energy intake
Gg	gigagram
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
ISW	industrial solid waste
kg	kilogram
kha	kilohectare
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MSW	municipal solid waste
N	nitrogen
NA	not applicable
NCV	net calorific value
NE	not estimated
NEIS	National Emission Information System
NES	national energy statistics
NEU	non-energy use
Nex	nitrogen excretion rate

NFI	national forest inventory
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
PFC	perfluorocarbon
PJ	petajoule
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
SU SR	Statistical Office of the Slovak Republic
SWDS	solid waste disposal site
TJ	terajoule
UNFCCC	United Nations Framework Convention on Climate Change
WDR	wetland drainage and rewetting