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

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual inventory of emissions and removals of greenhouse gases for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual review of the 2022 annual submission of Czechia, 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 10 to 15 October 2022 in Bonn.

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

Contents

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex A source	source category included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
$CaCO_3$	calcium carbonate
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
Convention reporting adherence	adherence to the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
CPR	commitment period reserve
CRF	common reporting format
CSC	carbon stock change
CZSO	Czech Statistical Office
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU	European Union
EU ETS	European Union Emissions Trading System
EUROCONTROL	European Organisation for the Safety of Air Navigation
Eurostat	statistical office of the European Union
F-gas	fluorinated gas
FM	forest management
FMRL	forest management reference level
$FMRL_{corr}$	forest management reference level technical correction
$Frac_{LEACH-(H)}$	fraction of N input to managed soils that is lost through leaching and run-off
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
ISOH	information system on waste management of the Czech Ministry of the Environment
KP reporting adherence	adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
KP-LULUCF	activities under Article 3, paragraphs 3–4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry

MCF	methane conversion factor
MMS	manure management system
MSW	municipal solid waste
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NE	not estimated
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulfur hexafluoride
SWDS	solid waste disposal site(s)
TAM	typical animal mass
TOW	total organic load in wastewater
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction

1. This report covers the review of the 2022 annual submission of Czechia, organized by the secretariat in accordance with the Article 8 review guidelines (adopted by decision 22/CMP.1 and revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (annex to decision 13/CP.20). The review took place from 10 to 15 October 2022 in Bonn and was coordinated by Sevdalina Todorova (secretariat). Table 1 provides information on the composition of the ERT that conducted the review for Czechia.

Table 1
Composition of the expert review team that conducted the review for Czechia

Area of expertise	*Name*	*Party*
Generalist	Giorgi Mukhigulishvili	Georgia
	Harry Vreuls	Netherlands
Energy	André Amaro	Portugal
	Brooke Elizabeth Perkins	Australia
IPPU	Stanford Mwakasonda	United Republic of Tanzania
	Ann Marie Ryan	Ireland
Agriculture	Richard German	United Kingdom
	Mahmoud Medany	Egypt
	Ben Morrow	New Zealand
LULUCF and KP-LULUCF	Atsuko Hayashi	Japan
	Yasna Rojas Ponce	Chile
	Valentyna Slivinska	Ukraine
Waste	Chart Chiemchaisri	Thailand
	José Ramírez García	Spain
Lead reviewers	Giorgi Mukhigulishvili	
	Harry Vreuls	

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

3. The ERT has made recommendations that Czechia resolve identified findings, including issues[1] designated as problems.[2] Other findings, and, if applicable, the encouragements of the ERT to Czechia to resolve related issues, are also included in this report.

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

5. Annex I presents the annual GHG emissions of Czechia, including totals excluding and including LULUCF, indirect CO_2 emissions, and emissions by gas and by sector, and contains background data on emissions and removals from KP-LULUCF, if elected by the Party, by gas, sector and activity.

[1] Issues are defined in decision 13/CP.20, annex, para. 81.
[2] Problems are defined in decision 22/CMP.1, annex, paras. 68–69, as revised by decision 4/CMP.11.

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

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

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

Table 2
Summary of review results and general assessment of the 2022 annual submission of Czechia

Assessment			*Issue/problem ID#(s) in table 3 or 5*[a]
Date of submission	Original submission: NIR, 14 April 2022; CRF tables (version 1), 14 April 2022; SEF tables (SEF-2021-CP2), 14 April 2022		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and the Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:		
	(a) Identification of key categories?	Yes	G.5
	(b) Selection and use of methodologies and assumptions?	Yes	I.11, A.9, A.15, W.5, W.11
	(c) Development and selection of EFs?	Yes	E.21, L.10
	(d) Collection and selection of AD?	Yes	I.14, I.32
	(e) Reporting of recalculations?	No	
	(f) Reporting of a consistent time series?	Yes	E.23, A.13, A.14, A.17
	(g) Reporting of uncertainties, including methodologies?	No	
	(h) QA/QC?	QA/QC procedures were assessed in the context of the national system (see supplementary information under the Kyoto Protocol below)	
	(i) Missing categories, or completeness?[b]	Yes	I.4, W.6, W.7
	(j) Application of corrections to the inventory?	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	No	G.1, I.24
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 related to the following aspects of the national system:		
	(a) Overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements?	No	
	(b) Performance of the national system functions?	No	
	Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry?	No	
	(b) Performance of the functions of the national registry and the adherence to technical standards for data exchange?	No	

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

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

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

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

8. Table 3 compiles the recommendations from previous review reports that were included in the most recent previous review report, published on 10 February 2022, and had not been resolved by the time of publication of the report on the review of the Party's 2021 annual submission. The ERT has specified whether it believes the Party had resolved, was addressing or had not resolved each issue or problem by the time of publication of this review report and has provided the rationale for its determination, which takes into consideration the publication date of the most recent previous review report and national circumstances.

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

ID#	*Issue/problem classification*[a, b]	*Recommendation from previous review report*	*ERT assessment and rationale*
General			
G.1	Annual submission (G.5, 2021) Transparency	Provide information in the NIR and the CRF tables on the likely level of significance for categories considered insignificant in terms of the overall level of and trend in national emissions and thus reported as "NE" as per paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and show in the NIR that the total national aggregate estimated emissions for all such gases and categories reported as "NE" remain below 0.1 per cent of the national total GHG emissions.	Addressing. The Party included a general assessment of completeness in its NIR (section 1.7, p.46) and included a reference to CRF table 9, in which explanations for reporting categories as "NE" are included. The general assessment of completeness (section 1.7) is similar to that provided in the 2021 NIR. Although the Party reported the emissions for some categories (see ID#s E.12 and I.24 below) as "NE" on the basis of their likely insignificance in line with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines, it did not include information on the likely level of significance or confirm that the total national aggregate estimated emissions for all gases and categories considered insignificant remain below 0.1 per cent of the national total GHG emissions. During the review, Czechia clarified that no calculated estimate and hence no aggregated estimate can be given owing to a lack of data or EFs. Emissions are expected to be very low in each "NE" category and the aggregated level is expected to be under 0.1 per cent of the national total emissions based on expert judgment and the reasons listed in CRF table 9. The Party also noted that it will provide justifications and the likely level of significance for the emissions from the "NE" categories for which there are methodologies available in the 2006 IPCC Guidelines (e.g. in tabular format) in its next submission. The ERT considers that the recommendation has not yet been addressed because the Party has not provided clear information on the level of insignificance of the categories reported as "NE" or on the aggregate estimated emissions for all gases and categories reported as "NE".
G.2	Archiving (G.1, 2021) (G.1, 2019) (G.10, 2017) KP reporting adherence	Improve the documentation on how qualitative information (e.g. expert judgment) on key parameters (e.g. the parameters used in the uncertainty analysis) is generated and improve the archiving of	Addressing. The Party reported throughout its NIR use of expert judgment for informing the assessment of uncertainties and other key parameters. In its NIR (section 1.2.2, pp.22–23) Czechia also noted that its inventory management includes a control system for all documents and data, and for records and their archives, as well as documentation on QA/QC activities. However, the Party did not clearly document in the NIR how expert

ID#	*Issue/problem classification*[a, b]	*Recommendation from previous review report*	*ERT assessment and rationale*
		this information in order to improve transparency.	judgment on key parameters is generated or the relevant information archived. The ERT notes that reporting of the expert judgment is still not in accordance with the protocol for expert judgment elicitation of the 2006 IPCC Guidelines (vol. 1, annex 2.A.1). During the review, Czechia indicated that sector experts have been provided with templates and instructions for provision of expert judgment and, for the next submission, the compiler team will collect the completed templates for archiving. The Party also shared with the ERT the template expert judgment form, which the ERT noted was in accordance with the 2006 IPCC Guidelines (vol. 1, annex 2.A.1). The ERT considers that the recommendation has not yet been fully addressed because the Party has not updated its archive to include information on expert judgment to improve the transparency of underlying assumptions and parameters (e.g. those used in the uncertainty analysis).
G.3	Key category analysis (G.2, 2021) (G.4, 2019) (G.4, 2017) (G.11, 2016) (G.11, 2015) Convention reporting adherence	Provide in the NIR a key category analysis that is prepared in accordance with the 2006 IPCC Guidelines.	Resolved. Czechia reported in its NIR (section 1.5, pp.42–45, and annex 1, pp.447–475) a key category analysis which is in accordance with the 2006 IPCC Guidelines (vol. 1, chap. 4.3). The Party identified the categories under the threshold of 95 per cent for both the level and trend assessments including and excluding LULUCF and the first category that surpasses the threshold. During the review, the Party provided the ERT with the calculation files for the key category analysis. The ERT verified that the correct approach was used.
G.4	Key category analysis (G.3, 2021) (G.14, 2019) Convention reporting adherence	Review the key category analysis calculations and apply the approach 2 methodology from the 2006 IPCC Guidelines (vol. 1, chap. 4.3.2) for key category analysis correctly.	Resolved. Czechia reported the key category analysis and calculation tables using approach 2 methodology from the 2006 IPCC Guidelines in its NIR (section 1.5, tables 1-10–1-11, pp.42–43, and annex 1, tables A1-7–A1-10, pp.461–475). During the review, the Party shared with the ERT files detailing the calculations underlying the key category analysis. The ERT noted that the steps and underlying calculations presented in the files are correct and in accordance with the methodology described in the 2006 IPCC Guidelines (vol. 1, chap. 4.3.2). The calculation errors detected in the previous reviews have been corrected and categories 2.H other (CO_2), 2.H other (HFCs) and 2.E.1 integrated circuits or semiconductors (PFCs), which were omitted from the 2021 NIR, were included in the analysis.
G.5	Key category analysis (G.6, 2021) Convention reporting adherence	(a) Address errors in implementing the key category analysis using approach 1, level and trend, for the base and most recent inventory year, including and excluding LULUCF; (b) ensure consistency in the information on key category analysis presented in the NIR and CRF table 7 (especially if continuing to use the same disaggregation level);	(a) Resolved. The Party reported in its NIR (section 1.5, pp.42–44) and CRF table 7 a key category analysis using approach 1, level and trend assessment, including and excluding LULUCF (see ID# G.4 above). (b) Resolved. There is consistency in the information on key category analysis presented in the NIR and CRF table 7 (including for categories 1.A.1 (fuel combustion – energy industries – liquid fuels – CO_2) and 2.B.2 (nitric acid – N_2O) for which inconsistencies were detected in the 2021 ARR) and the Party uses a similar disaggregation level in both the NIR and CRF table 7.

ID#	*Issue/problem classification*[a, b]	*Recommendation from previous review report*	*ERT assessment and rationale*
		(c) include information on the level of category disaggregation and the rationale for its use in the NIR.	(c) Not resolved. Czechia did not include additional information on the level of category disaggregation and its rationale in the NIR and the ERT noted that this is not in accordance with paragraph 50(ii) of the UNFCCC Annex I inventory reporting guidelines. During the review the Party clarified that in some cases the differences in the level of disaggregation are in order to ensure consistency with approach 2 calculations where some of the categories are disaggregated in a different way from that in the 2006 IPCC Guidelines (vol. 1, chap. 4, table 4.1). The Party will investigate the possibility of making changes and information on the level of category disaggregation will be included in the next submission.
G.6	QA/QC and verification (G.4, 2021) (G.9, 2019) (G.15, 2017) Transparency	Use the 2006 IPCC Guidelines as the only guidelines on QA/QC procedures and remove all outdated references to earlier IPCC guidelines from the NIR in order to improve transparency and comparability.	Resolved. Czechia reported in its NIR (section 1.2.3.6, p.27) that it uses the 2006 IPCC Guidelines as the basis for developing and implementing QA/QC procedures. The Party has removed all outdated references to earlier IPCC guidelines from the NIR.
G.7	Recalculations (G.8, 2021) Transparency	Provide in the NIR information on the impact of any recalculations, as well as explanatory information on and justification for the recalculations, in accordance with paragraphs 43–45 and 50(h) of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party has improved its inventory and implemented recalculations since its 2021 submission (see ID#s E.4, E.7, E.8, E.10, I.25, W.1, KL.2 and KL.6). Besides numerical information on the recalculation in CRF table 8, the category-specific recalculations are explained in the relevant section of the NIR for each category and chapter 10 of the NIR summarizes the recalculations for each sector and their implications for the emission level, which is in accordance with paragraphs 43–45 and 50(h) of the UNFCCC Annex I inventory reporting guidelines.
G.8	Uncertainty analysis (G.9, 2021) Convention reporting adherence	Include in the NIR an uncertainty assessment for 1990 (the base year under the Convention).	Resolved. The Party reported in its NIR (annex 2, pp.476–489) the results of its uncertainty analysis using approach 1 from the 2006 IPCC Guidelines (vol. 1, chap. 3.2.3) including and excluding LULUCF for the most recent inventory year (2020) and the base year (1990) under the Convention.
G.9	Uncertainty analysis (G.10, 2021) Convention reporting adherence	Quantitatively estimate uncertainty for PFCs from integrated circuits or semiconductors (category 2.E.1), CO_2 from pulp and paper processes (category 2.H.1) and hydrofluoroolefins from use in refrigeration and air conditioning (category 2.H.3 (other)).	Resolved. The Party reported a quantitative estimation of uncertainty for the source and sink categories included in its inventory. In its NIR (annex 2, tables A2 1–A2 2, pp.476–478) Czechia also included information on the quantitative estimates for the uncertainty for F-gases for category 2.E.1 (electronics industry – integrated circuits or semiconductors) and for CO_2 and F-gases for category 2.H (other).
Energy			
E.1	1. General (energy sector) – all fuels (E.1, 2021) (E.10, 2019) Transparency	Either ensure that the energy balance information provided in the NIR matches the data reported in the CRF tables or include an explicit statement in the NIR explaining that the information provided has not been used in the inventory.	Not resolved. The energy balance information provided in the NIR does not completely match the data reported in the CRF tables. For example, the values in CRF table 1.A(a)s3 for road transportation (59,820.74 TJ for gasoline and 171,360.46 TJ for diesel for 2020) differ from the values calculated using the data for fuel consumption reported in annex 4 and the NCV provided in annex 5 (65,510.50 TJ for gasoline and 186,350.21 TJ for diesel).

ID#	*Issue/problem classification*[a, b]	*Recommendation from previous review report*	*ERT assessment and rationale*
			During the review, the Party clarified that fuel sales reported in the energy balance include both the fossil fuels (diesel and gasoline) and the biofuels (biodiesel and biogasoline) and for that reason the values reported in tables A4.4 and A4.5 of annex 4 to the NIR are higher than the values reported in CRF table 1.A(a)s3. Czechia also clarified that the fuel consumption used in category 1.A.3.b is provided by CZSO, which reports road fuel consumption in a disaggregated manner allowing for the separation of the fossil and biocomponents of fuels. The ERT considers that this issue has not been resolved, because differences remain between the information provided in the NIR and the data reported in the CRF tables, and the reason for these differences is not explicit in the NIR, nor is it clear what information was used to estimate emissions of category 1.A.3.b (road transportation).
E.2	1.A.1.a Public electricity and heat production – solid fuels – CO_2, CH_4 and N_2O (E.13, 2021) Comparability	Recalculate emissions from electricity generation for solid fuels for 1990–2009 by reallocating the AD on fuel consumption to category 1.A.1.a.ii (combined heat and power generation) and ensure consistent reporting of subcategories 1.A.1.a.i (electricity generation – solid fuels) and 1.A.1.a.ii (combined heat and power generation) across the time series.	Resolved. The option to further disaggregate the emissions under category 1.A.1.a (public electricity and heat production) in CRF table 1.A(a)s1 is no longer used. AD on fuel consumption for subcategories 1.A.1.a.ii (combined heat and power generation) and 1.A.1.a.iii (heat plants) have been relocated and aggregated data have been reported to subcategory 1.A.1.a.i (electricity generation). This allocation of AD and consequent allocation of emissions did not lead to recalculations of emissions for category 1.A.1.a (public electricity and heat production) for solid fuels.
E.3	1.A.1.a Public electricity and heat production – gaseous fuels – CO_2 (E.14, 2021) Transparency	Include in the NIR an explanation of the trend in fuel consumption for combined heat and power generation.	Resolved. In its current submission Czechia decided to aggregate emission estimates from three subcategories under 1.A.1.a (1.A.1.a.i (electricity generation); 1.A.1.a.ii (combined heat and power generation); 1.A.1.a.iii (heat plants)) to resolve inter-annual inconsistencies when using data from CZSO. The Party included in its NIR (section 3.2.7.1, p.75) an explanation for the trend of consumption of gaseous fuels for 1.A.1.a. (including combined heat and power generation), thus covering inter-annual changes in gaseous fuel consumption for the subcategory.
E.4	1.A.1.a Public electricity and heat production – other fossil fuels and biomass – CH_4 and N_2O (E.15, 2021) Accuracy	Correct the error identified and recalculate CH_4 and N_2O emissions (other fossil fuels and biomass) for category 1.A.1.a (public electricity and heat production) for the entire time series.	Resolved. Estimated CH_4 and N_2O emissions from biomass and other fossil fuels in category 1.A.1.a (public electricity and heat production) were revised for 1990–2018 to correct the error identified. The impact of the recalculations is presented in the NIR (section 3.2.7.4, pp.77–80). The ERT confirmed that the values correspond to the values in the 2020 submission, as expected, following the correction of the error.
E.5	1.A.1.b Petroleum refining – liquid fuels – CO_2 (E.16, 2021) Transparency	Explain the trend in CO_2 emissions for category 1.A.1.b (petroleum refining – liquid fuels) by describing the growth of petroleum refining until 2008 as a global trend, and the factors that caused the decline in 2015–2016 (i.e. the accident at the ethylene unit, which	Resolved. The explanation of the CO_2 emission trend for category 1.A.1.b (petroleum refining – liquid fuels) was included in the NIR (section 3.2.7.6, pp.81–82) describing the growth of petroleum refining until 2008 as a global trend and the factors that caused the decline in 2015–2016 (in particular, the accident at the ethylene unit, which caused the shutdown of the refining industry). Cross references were added in the NIR for the IPPU

ID#	*Issue/problem classification*[a, b]	*Recommendation from previous review report*	*ERT assessment and rationale*
		caused the shutdown of the refining industry), including by adding cross references to the IPPU chapter, in its next NIR.	chapter in the energy chapter (section 3.2.7.6, p.82) and further explanations were provided in the IPPU chapter (section 4.3.8.2, pp.181–182).
E.6	1.A.2.c Chemicals – liquid and solid fuels – CO_2, CH_4 and N_2O (E.17, 2021) Transparency	Explain the reason for the significant fluctuation in AD on fuel consumption for category 1.A.2.c (chemicals – liquid fuels) across the time series in the NIR in line with the explanation provided to the ERT during the 2021 review.	Not resolved. The Party continues to report AD on fuel consumption of liquid and solid fuels with significant inter-annual changes. For liquid fuels the following inter-annual changes are considered significant across the time series: 1999–2000 (–63.9 per cent), 2003–2004 (1,163.6 per cent), 2005–2006 (–54.8 per cent) and 2009–2010 (173.47 per cent); while for solid fuels the most significant inter-annual changes were noted in 1998–1999 (157.0 per cent), 1999–2000 (93.30 per cent), 2006–2007 (–42.2 per cent) and 2009–2010 (–67.2 per cent). Czechia did not provide in its NIR an explanation for the significant fluctuation in AD on fuel consumption for category 1.A.2.c (chemicals – liquid fuels) across the time series. During the 2021 review the Party had explained that the fluctuation in fuel consumption is influenced by many factors, including economic development, the production plan of companies and the stocks they maintain, meteorological conditions and efforts to reduce the energy intensity of processes in the chemical industry. During the current review, Czechia acknowledged that this information was missing from the NIR and will be included in the next submission.
E.7	1.A.2.f Non-metallic minerals – other fossil fuels – CO_2, CH_4 and N_2O (E.3, 2021) (E.3, 2019) (E.17, 2017) Accuracy	Revise the estimates and report CO_2, CH_4 and N_2O emissions from the biogenic fraction (CH_4 and N_2O emissions reported under category 1.A.2.f; CO_2 emissions reported as a memo item) of alternative fuels used in non-metallic industry for the whole time series.	Resolved. The Party recalculated CO_2, CH_4, and N_2O emissions from the biogenic fraction of alternative fuels that have an impact on the emissions of biomass under category 1.A.2.f (non-metallic minerals) for the reported time series as a result of revising the methodology used to estimate and report separately the biogenic fraction present in industrial waste. The methodology and impact of the recalculations are covered in the NIR, in sections 3.2.14.2 (p.100) and 3.2.14.5 (pp.101–103) respectively.
E.8	1.A.2.f Non-metallic minerals – other fossil fuels – CO_2 (E.18, 2021) Accuracy	Revise the AD and recalculate the CO_2 emissions for other fossil fuels for category 1.A.2.f (non-metallic minerals), making sure that other fossil fuels include only the relevant fuels (non-biomass fraction of municipal waste, industrial waste and waste oils) as per the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1), also considering the new data set available from the Czech Cement Association (https://www.svcement.cz/data/data-2020/).	Resolved. The AD were revised and this led to recalculations of CO_2, CH_4 and N_2O emissions for 2008–2009 and 2012–2019. The impact of the recalculations was reported in section 3.2.14.5 (pp.101–103) of the NIR. The Party included in section 3.2.14.2 (p.100) a detailed description of the methodology used to review the AD, including how the biofuel component of other fossil fuels was considered, which is in line with the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1).
E.9	1.A.3.a Domestic aviation – jet kerosene – CO_2, CH_4 and N_2O	Obtain more accurate data on jet kerosene consumption for domestic aviation, following the approaches set out in the 2006	Resolved. Czechia obtained more accurate data on jet kerosene consumption for domestic aviation by obtaining bottom-up data from EUROCONTROL for the time series 2005–2020 for flights using instrument flight rules, applying a method comparable with a tier 3

ID#	Issue/problem classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
	(E.5, 2021) (E.4, 2019) (E.19, 2017) Accuracy	IPCC Guidelines (vol. 2, chap. 3.6.1.3), by obtaining either top-down data on jet kerosene consumption from taxation authorities or bottom-up data from surveys of airline companies or air traffic control records (e.g. data from EUROCONTROL on the number of domestic and international flights by aircraft type) (the higher fuel consumption per km for domestic flights should be considered in this approach).	method. The time series 1990–2005 was estimated by extrapolation of EUROCONTROL fuel consumption data and supplemented with fuel consumption data from a Czech Oil questionnaire provided by CZSO. For flights using the visual flight rules and helicopters, the ratio between landing and take-off, and cruise was obtained from the Civil Aviation Authority. The EFs provided in the 2006 IPCC Guidelines (vol. 2, chap. 3.6.1.3) were applied to fuel consumption data obtained from CZSO. Updating the AD led to recalculations in categories 1.A.3.a (domestic aviation), 1.A.5.b.i (mobile aviation) and 1.D.1 (international aviation) for the entire time series. More details on the updates made to the methodology are provided in the NIR (section 3.2.16.9.1.1, p.121).
E.10	1.A.4.a Commercial/ institutional – gaseous fuels – CO_2, CH_4 and N_2O (E.19, 2021) Consistency	Recalculate the emissions for 1992–1994 by making efforts to obtain data on natural gas consumption or, if that is not possible, by deriving the data using appropriate data splicing techniques provided in the 2006 IPCC Guidelines (vol. 1, chap. 5, section 5.3.3).	Resolved. Estimates of CO_2, CH_4 and N_2O emissions from gaseous fuels for 1992–1994 in category 1.A.4.a (commercial/institutional) were revised using interpolation as described in the 2006 IPCC Guidelines (vol. 1, chap. 5, section 5.3.3). The impact of the recalculations is presented in the NIR (section 3.2.17.5, pp.123–124).
E.11	1.A.5.b Mobile – all fuels – CO_2, CH_4 and N_2O (E.6, 2021) (E.6, 2019) (E.20, 2017) Transparency	Revise the description of emissions under category 1.A.5.b.i (mobile (other)) to indicate that they are emissions from agriculture, forestry and fishing and not from aviation by the army, State institutions or private air transport.	Resolved. Czechia described in its NIR (section 3.2.20, pp.130–131) that, in accordance with the 2006 IPCC Guidelines, category 1.A.5.b is divided into 1.A.5.b.i – mobile (aviation component) and 1.A.5.b.iii – mobile (other). Fuel consumption and corresponding emissions of GHGs from military aviation, besides public air transport, are reported under subcategory 1.A.5.b.i. Subcategory 1.A.5.b.ii has not been reported in CRF table 1.A(a)s4 and subcategory 1.A.5.b.iii has been used to report all remaining fuels that have not been reported elsewhere, including ground vehicles in military and government institutions.
E.12	1.B.2.a Oil – liquid fuels – CO_2 and CH_4 (E.7, 2021) (E.7, 2019) (E.13, 2017) (E.20, 2016) (E.19, 2015) Convention reporting adherence	(a) Change the notation key for oil exploration to "NE" and indicate in both the NIR and the CRF completeness table why those emissions or removals have not been estimated; (b) provide in the NIR a justification for the exclusion in terms of the likely level of emissions in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	(a) Addressing. The Party used the notation key "NE" for reporting emissions from 1.B.2.a.1 oil (exploration) and explained in the NIR (section 3.3.2.1.1, p.148) why those emissions have not been estimated. However, Czechia did not include this explanation in CRF table 9 on completeness. (b) Resolved. The Party included in its NIR (section 3.3.2.1.1, p.148) a justification for the exclusion in terms of the likely level of emissions in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.
E.13	1.B.2.a Oil – liquid fuels – CH_4 (E.20, 2021) Transparency	Include the explanation for the significant decrease in the CH_4 IEF for category 1.B.2.a.4 oil (refining/storage) provided during the 2021 review in the NIR.	Addressing. Czechia included an explanation for the significant decrease in the CH_4 IEF for category 1.B.2.a.4 oil (refining/storage) in the NIR (section 3.3.2.2.1, p.153). However, regarding the assumption on the continuing 'ecologization' of the refineries and

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			oil storage facilities, it was not clear how it underpins the choice of default EFs over the time series. During the review, the Party explained in detail the assumptions made to select the CH_4 EFs to estimate emissions in category 1.B.2.a.4 oil (refining/storage) for different periods of the time series, trying to replicate the operating condition of the refineries of the country. For years prior to 2000, the maximum values of CH_4 EFs published in the *Revised 1996 IPPC Guidelines for National Greenhouse Gas Inventories* (vol. 2, table 1-6) were selected. This conservative approach attempts to replicate the poor condition of refineries during the 1990s. For 2002–2012, the maximum value of the CH_4 EF for developed countries was taken from the 2006 IPCC Guidelines (vol. 2, chap. 4, table 4.2.4). For 2013–2020, the average value of the CH_4 EFs for developed countries in the 2006 IPCC Guidelines was used, reflecting recent improvements in the fuel refining process in Czechia. The ERT considers that, to address this issue fully, the assumptions regarding the CH_4 EF selection provided during the review should be included in the NIR, as well as a justification for the stepwise approach used.
E.14	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.21, 2021) Accuracy	Recalculate the CH_4 emissions for category 1.B.2.b.2 (natural gas production) for 2005 using the correct EF.	Resolved. The CH_4 emissions for category 1.B.2.b.2 (natural gas production) for 2005 were recalculated to correct the detected input error using the correct EF (replacing 29,486.68 with 39,365.45 kg/PJ) in line with the EFs used for the 1990–2020 time series.
E.15	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.22, 2021) Transparency	Improve the description in the NIR of the methodology for calculating emissions from gas distribution, including the evolution of the AD (on the length of distribution network, the number of gas pressure regulation stations and number of customers) to explain the trend in AD for category 1.B.2.b.5 (natural gas distribution).	Resolved. The Party included in its NIR a description of the methodology for calculating emissions from gas distribution and provided justifications for the large inter-annual AD fluctuations for 1990–2011 (section 3.3.2.1.2, p.150).
E.16	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.23, 2021) Transparency	Correctly describe both in the documentation box to CRF table 1.B.2 and the NIR where the emissions for subcategory 1.B.2.b.6 are included.	Addressing. The Party included an explanation in the documentation box of table CRF 1.B.2 for emissions for category 1.B.2.b.6 (natural gas – other) being included in category 1.B.2.b.4 (natural gas – transmission and storage). During the review, Czechia provided a detailed explanation as to why emissions for 1.B.2.b.6 are included in 1.B.2.b.4. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet included the information on the emissions allocation in the NIR and has not corrected the explanation for the notation key “IE” in CRF table 9 to refer to subcategory 1.B.2.b.4.

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E.17	Comparison with international data – solid fuels – CO_2 (E.8, 2021) (E.11, 2019) Transparency	Improve the transparency of reporting on the AD and emissions from waste in the energy sector, for example by providing in the NIR information on the number of waste incineration plants, the total waste incineration capacity and the waste amounts included in the inventory.	Resolved. The Party reported the number of waste incineration plants, the total waste incineration capacity and the waste amounts in its NIR (section 3.2.7.1.1, pp.76–77).
E.18	Comparison with international data – solid fuels – CO_2 (E.9, 2021) (E.11, 2019) Transparency	Clearly specify in the NIR the allocation of emissions from waste across the energy and waste sectors.	Resolved. The Party included in its NIR (section 3.2.7.1.1, p.76) a description of how waste incineration emissions are distributed in the inventory between the energy and waste sectors: all waste (predominantly MSW) incinerated in waste incinerators with energy use is accounted for under the energy sector (category 1.A.1.a – public electricity and heat production), while the rest of the incinerated waste is accounted for under the waste sector (category 5.C – incineration and open burning of waste). The information is taken from the publicly available version of ISOH.
E.19	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2 (E.10, 2021) (E.12, 2019) Convention reporting adherence	Transparently report on LPG and gas/diesel oil in CRF table 1.A(d) and the NIR, including providing information on the CO_2 emissions from the non-energy use reported in the inventory and the allocation of the emissions in the inventory.	Resolved. Czechia reported on LPG and gas/diesel oil in CRF table 1.A(d), providing information on the CO_2 emissions from the non-energy use reported in the inventory and their allocation in the inventory (ethylene and petrochemical, and carbon black production, respectively). The Party also reported the NCV and EFs for both LPG and gas/diesel oil in its NIR (table 3.10, p.67).
E.20	International bunkers and multilateral operations – liquid fuels – CO_2 (E.12, 2021) (E.15, 2019) Convention reporting adherence	Report consistent information for bunker fuels between CRF tables 1.A(b) and 1.D, or, if this cannot be done, clearly explain any discrepancies in the NIR.	Addressing. The Party reported jet kerosene consumption (international aviation bunkers) for 2020 as 4,787.34 TJ both in CRF table 1.A(b) and in CRF table 1.D. However, for 1990–2019 differences remain between the consumption of jet kerosene reported in the two tables (e.g. for 2019 the Party reported 17,696.71 TJ in CRF table 1.A(b) and 17,624.32 TJ in CRF table 1.D). During the review, Czechia explained that the data are due to be corrected in the next submission. The ERT considers that the recommendation has not yet been fully addressed because the Party has not corrected the differences for 1990–2019.
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I.1	2.A.2 Lime production – CO_2 (I.1, 2021) (I.20, 2019) Consistency	Investigate whether a purity adjustment is required for the country-specific CO_2 EF for lime production, and, if no purity adjustment is required, recalculate CO_2 emissions from lime production for 1990–2009 using the EF of 0.7884 t CO_2/t lime.	Resolved. The Party investigated and justified the need for a purity adjustment for the country-specific CO_2 EF, leading to no changes in the country-specific CO_2 EF used by the Party for 1990–2009. The Party reported updated information in the NIR (section 4.2.2.2, pp.164–165) and annex 3.5 that the calculations for 1990–2009 are based on data from the Czech Lime Association that do not account separately for pure lime and carbonate additives. To account for carbonate additives and other impurities, the national purity factor is applied to total lime produced to determine the total quantity of pure

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			calcium oxide in produced lime. The quantity of pure calcium oxide is then taken as the relevant AD and multiplied by the country-specific EF.
I.2	2.A.2 Lime production – CO_2 (I.2, 2021) (I.20, 2019) Transparency	Otherwise (see ID# I.1 above), explain the difference between the EF verified under the EU ETS and the EF used for the CO_2 emission estimates for 1990–2009 (0.733 t CO_2/t lime) and justify in the NIR the approach of applying a purity adjustment to the country-specific EF.	Resolved. The Party updated its NIR (section 4.2.2.2, p.164, and annex 3.5, pp.505–507) and included a detailed explanation of the difference between the EF verified under the EU ETS and the country-specific CO_2 EF justifying the use of a purity adjustment for 1990–2009 (see ID# I.1 above).
I.3	2.A.2 Lime production – CO_2 (I.14, 2021) Convention reporting adherence	Update the graphs to improve transparency on the choice of country-specific EFs for lime production and implement QC practices to reduce the likelihood of drafting errors in future NIRs.	Resolved. The Party provided updated graphs in annex 3 to the NIR (figures A3-6–A3-7, p.506), suggesting improved QC.
I.4	2.A.4 Other process uses of carbonates – CO_2 (I.3, 2021) (I.1, 2019) (I.1, 2017) (I.10, 2016) (I.10, 2015) Completeness	Collect the missing AD for 1990–2006 on mineral wool production and estimate and report CO_2 emissions.	Addressing. Czechia had included estimates from 2000–2006 in its 2021 submission based on collected AD for 2000–2002 and using interpolation for 2003–2006. The Party has not provided emission estimates for 1990–1999 and continues to use the notation key "NE" for mineral wool production for 1990–1999 and report emissions from mineral wool production for 2000–2020 in CRF table 2(I).A-Hs1. Czechia explained in its NIR (section 4.2.4.6, p.171) that identifying a source for AD for mineral wool production for 1990–1999 is scheduled. During the review, the Party explained that that the category falls below the significance level and, as there are no reliable AD for 1990–1999 and new sources are unlikely to be discovered, Czechia is considering alternative estimation methods.
I.5	2.A.4 Other process uses of carbonates – CO_2 (I.15, 2021) Transparency	Investigate the methods used to estimate emissions and removals from recarbonation and clearly document the process, for example through reference and citation of EU ETS methods and data.	Resolved. The Party explained in its NIR (section 4.2.4.2, p.169) that it previously included production of $CaCO_3$ in one paper mill in Czechia, stating that during this process, CO_2 reacts with hydrated lime, forming $CaCO_3$. For each mole of $CaCO_3$ produced, one mole of CO_2 is absorbed, so the mass of CO_2 removal can be estimated from the produced amount of $CaCO_3$ and the stoichiometry of the chemical process. Czechia noted, however, that when lime and cement products are used in construction, the same reaction occurs and these processes are not included in estimations. It therefore decided to no longer include reporting of removals from absorption of CO_2 in $CaCO_3$ production in the inventory. The ERT determines that this issue is resolved, as net removals from recarbonation are no longer reported.
I.6	2.A.4 Other process uses of carbonates – CO_2 (I.15, 2021) Transparency	Report emissions and removals from recarbonation under category 2.H (other) in line with the 2006 IPCC Guidelines.	Resolved. The Party investigated its reporting of the category and explained in its NIR (section 4.2.4.2, p.169) that the reporting of CO_2 removal in $CaCO_3$ production was discontinued, given that the 2006 IPCC Guidelines (vol. 3, chap. 2, p.2.19) state that recarbonation may be reported only where proven and validated methods are used.

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			Therefore, the requirement to report emissions and removals under category 2.H (other) is no longer valid (see ID# I.5 above).
I.7	2.A.4 Other process uses of carbonates – CO_2 (I.16, 2021) Transparency	Explain the use of notation keys for reporting emissions from urea use in denitrification.	Addressing. The Party reported in NIR table 4-8 (section 4.2.4.2, p.170) that emissions from urea use in denitrification were reported as "NO" for 1990–2015 and "NE" for 2016, with estimates provided for 2017–2020. Czechia explained in its NIR (section 4.2.4.2, p.169) and during the review that denitrification by using urea appeared in the EU ETS for the first time in 2017 and this technology was introduced in the country at the same time, which explains the use of notation key "NO" before 2016. The notation key for 2016 ("NE") was not explained in the NIR and not changed to "NO" in line with the explanation in the NIR.
I.8	2.A.4 Other process uses of carbonates – CO_2 (I.17, 2021) Comparability	Report emissions arising from urea used in denitrification under a separate subcategory under category 2.D.3 (non-energy products from fuels and solvent use – other) to improve comparability.	Not resolved. The Party reported in its NIR (table 4-8, p.170) and CRF table 2(I).A-Hs1 emissions from urea use in denitrification in category 2.A.4.d (other process uses of carbonates – other). Czechia explained that emissions from the denitrification process remain under category 2.A.4 because the data source for this process reports data from desulfurization and denitrification together and the chemical reaction for the two processes is the same. The ERT noted that the Party reported separately the desulfurization and denitrification emissions in NIR table 4-8 (p.170), showing that the denitrification emissions can be reported separately under category 2.D.3 (non-energy products from fuels and solvent use – other) to improve comparability of reporting.
I.9	2.B.1 Ammonia production – CO_2 (I.19, 2021) Comparability	Review reporting arrangements for emissions from ammonia production and ensure all emissions arising from both fuel and feedstock consumption of residual fuel oil and other oils are reported under category 2.B.1 (ammonia production) to improve comparability in line with the 2006 IPCC Guidelines.	Resolved. The Party reported in its NIR (section 3.2.3, pp.65–66 on feedstocks and section 4.3.1.4, p.175 on ammonia) as part of its QA/QC procedure that CO_2 emissions from residual oil and other oils used for ammonia production are not considered under the energy sector, but under the IPPU sector. The ERT noted that this is in accordance with the 2006 IPCC Guidelines (vol. 3, chap. 3, section 3.2.2) on the use of hydrocarbons (fuel oil) in the production of ammonia.
I.10	2.B.1 Ammonia production – CO_2 (I.19, 2021) Comparability	Improve the consistency of the reporting on the feedstock use for ammonia production reported in the NIR and CRF table 1.A(d).	Not resolved. The Party reported in its NIR (section 4.3.1, p.174) that hydrogen for ammonia production is derived from residual oil from petroleum refining. The ERT noted that Czechia has not improved the consistency in reporting of feedstock use in ammonia production: in the NIR residual fuel oil is noted as the feedstock used but CRF table 1.A(d) shows other oil used as feedstock in ammonia production. During the review, the Party reported that emissions from ammonia production are estimated using a tier 1 methodology from the 2006 IPCC Guidelines (vol. 3, chap. 3.2.2) that is not directly based on the feedstock input. Noting this information, the ERT considers that the recommendation has not yet been fully implemented, because the reporting on the feedstock used for ammonia production in the NIR and CRF table 1.A(d) is not consistent.

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I.11	2.B.1 Ammonia production – CO_2 (I.20, 2021) Accuracy	Explore the possibility of obtaining additional data directly from the single ammonia production facility in the country (e.g. ammonia production fuel requirements) to support applying a higher-tier method for estimating ammonia production emissions consistently with the 2006 IPCC Guidelines, or otherwise justify transparently the use of a tier 1 method for estimating ammonia production emissions, given that it is a key category.	Not resolved. The Party continues to use a tier 1 method and reported in its NIR (section 4.3.1.2, p.174) that ammonia production emissions are estimated using an EF obtained from the 2006 IPCC Guidelines (vol. 3, chap. 3, table 3.1) without justifying the method used. No planned improvements were reported for the category in section 4.3.1.6 (p.176) of the NIR. During the review, the Party confirmed the use of a tier 1 method from the 2006 IPCC Guidelines and explained that it is starting to carry out research on this matter and is planning to switch emission estimations from ammonia production to emission estimations from hydrogen production, which is the main material for ammonia production, using the *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, in future submissions.
I.12	2.B.2 Nitric acid production – N_2O (I.21, 2021) Convention reporting adherence	Ensure that the reporting of key categories is consistent between the data reported in the CRF tables and the NIR by implementing QC procedures.	Resolved. In its 2021 submission, the Party reported in CRF table 7 and section 4.1.1. of its NIR (p.167) that nitric acid production is a key category, but nitric acid was not identified as a key category in the summary table of IPPU key categories in the 2021 NIR (table 4-1, p.167). The Party has corrected this error, as consistent information is provided in CRF table 7 and section 4.1.1. of the NIR (p.158).
I.13	2.B.2 Nitric acid production – N_2O (I.22, 2021) Transparency	(a) Review and revise in the NIR the reporting on the estimation methods used for nitric acid production emissions for 1990–2012 to clarify whether estimation techniques are in line with the tier 1 method set out in the 2006 IPCC Guidelines; (b) clearly report on how emission estimates were derived for each year, taking into account different operating conditions and mitigation technologies, where applicable, and describe transparently the source of all values and terms referred to in the calculation of emission estimates.	(a) Not resolved. There are no recalculations or changes in the methodology applied to category 2.B.2 (nitric acid production) compared with that applied in the 2021 submission. The Party reported in its NIR (section 4.3.2.2, p.178) that AD for the estimation of emissions for 1990–2012 were based on a mean value of the nitric acid production capacity with non-selective catalytic reduction technology and compared with measured values of the outlet gas mixture. According to the information reported in the CRF tables, a tier 1 method has been applied and the EFs are plant-specific. As noted by the previous ERT, the explanation in the NIR does not correspond to the tier 1 method in the 2006 IPCC Guidelines (vol. 3, chap. 3, p.3.21) of multiplying nitric acid production AD by a default EF (based on production process), with an assumption of no abatement of N_2O emissions. During the review, the Party indicated that a tier 1 method has been applied for 1990–2012 with some modifications. The ERT considers that the reference to the IPCC methodological tier may need to be reconsidered in line with the decision tree for the category (2006 IPCC Guidelines, vol. 3, chap. 3, figure 3.2) and made consistent across the NIR and CRF tables. (b) Resolved. The Party provided country-specific N_2O EFs for 1990–2003 (table 4-15, p.177) and for 2004 onward (table 4-16, p.177) on the basis of studies for which references are provided in the NIR. The NIR (section 4.3.2.2, p.177) also provides information on the operating conditions and mitigation technologies, including that nitric acid is manufactured at three atmospheric pressure levels, the changes across the time series and the corresponding impact on the EFs and emissions from the category.

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I.14	2.B.4 Caprolactam, glyoxal and glyoxylic acid production – N_2O (I.6, 2021) (I.2, 2019) (I.17, 2017) Accuracy	Explore the possibility of obtaining additional data directly from the plant (e.g. operating conditions, AD, abatement technology) in order to increase the accuracy of the EF used and the N_2O emissions reported.	Addressing. The Party reported in its NIR (section 4.3.4.2, p.180) that there is only one facility producing caprolactam in the country that works at atmospheric pressure. Emissions of 246 t N_2O/year were estimated by using the plant-specific EF and working hours per year (8,000 hours/year). Czechia reported that, owing to a lack of AD after 2014–2016 (when the AD were obtained directly from the producer), the AD and assumptions used for 2017–2020 were the same as those used for 1990–2013 and the same constant N_2O emissions were reported (0.25 kt N_2O). Based on the similar values reported for 2014–2016 and the magnitude of the emissions, the ERT concluded that any potential underestimation of emissions for 2017–2020 due to the applied approach will be below the significance threshold for application of an adjustment in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 (56.67 kt CO_2 eq for Czechia in 2020) and therefore not included in the list of potential problems and further questions raised. During the review, Czechia explained that it is trying to obtain additional data from the facility, but there is no legal obligation on the facility to provide the information requested.
I.15	2.C.1 Iron and steel production – CO_2 (I.7, 2021) (I.6, 2019) (I.3, 2017) (I.2, 2016) (I.2, 2015) (38, 2014) (54, 2013) Transparency	Include information in the NIR on the changes in iron and steel production processes.	Addressing. The Party reported additional information in its NIR (section 4.4.1.2, p.187) on production processes in iron and steel production, such as the use of small amounts of bituminous coal in 2014–2020 as a reducing agent in blast furnaces, as well as coal tar use in the process in 2007–2013 and 2018–2020 (table 4-21, p.188), as also indicated during the review.
I.16	2.C.1 Iron and steel production – CO_2 (I.8, 2021) (I.7, 2019) (I.18, 2017) Transparency	Include a description of the different processes in iron and steel production occurring in the country, including the different mass flows and the mass balance of inputs and outputs of carbon in each process.	Resolved. The NIR (section 4.4.1.2, p.187) includes a description of the different processes in iron and steel production with information on the inputs and outputs in the processes. Czechia resolved the outstanding issues related to limestone and dolomite use (see ID# I.18 below). During the 2021 review, the ERT identified an additional issue related to pellet production, which is considered separately in ID# I.19 below). The ERT concludes that the original issue identified in the 2017 review has been resolved.
I.17	2.C.1 Iron and steel production – CO_2 (I.9, 2021) (I.22, 2019) Consistency	Review the estimated use of limestone and dolomite in iron and steel production for 1990–2009.	Resolved. The Party used the overlap method from the 2006 IPCC Guidelines (vol. 1, chap. 5, p.5.9) for 1990–2010 using the data available for 2011–2020, and the recalculation is described in the NIR (section 4.4.1.5, p.189). Czechia explained that more precise emission estimates for limestone and dolomite use will be provided when a higher methodological tier is used.
I.18	2.C.1 Iron and steel production – CO_2 (I.10, 2021) (I.22, 2019) Transparency	Include in the NIR an explanation of the approach used to estimate the use of limestone and dolomite for the years before EU ETS data were available.	Resolved. The Party reported in its NIR (section 4.4.1.2, p.188) that since no reliable data for limestone and dolomite used before 2011 are available in the statistics, the overlap method was used (see ID# I.17 above). Czechia further explained that the calculation of limestone and dolomite use is based on a strong correlation between the dolomite and limestone mass and the mass of coke used in furnaces.

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I.19	2.C.1 Iron and steel production – CO_2 (I.23, 2021) Transparency	Investigate whether pellet production is occurring in the country and reflect the findings in the reporting of pellet production emissions in the NIR and CRF table 2(I).A-Hs2, as appropriate.	Addressing. The Party reported in its NIR (section 4.4.1.2, p.187) that approximately 25 per cent of iron ore charge used in blast furnaces is provided from pellets, lump ores and other secondary material. Czechia further reported that ironwork companies are part of a wider grouping and there is no evidence of primary production of pellets. During the review, the Party clarified that pellets are used as a remaining portion of iron ore charge at a sinter plant. In the EU, there is only one integrated steelwork which includes a pellet production plant in the Netherlands and five stand-alone pellet production plants in Sweden, according to the EU best available technique reference document for iron and steel production. There is therefore no pellet production in Czechia and the pellets used in the process are imported. The ERT considers that the recommendation has not yet been fully addressed because the Party has not included the information on pellet production in the country in the NIR.
I.20	2.C.1 Iron and steel production – CO_2 (I.24, 2021) Transparency	Clearly explain in the NIR how electric furnaces and emissions from recycled iron and steel are accounted for in the emission estimates.	Addressing. The Party reported in its NIR (section 4.4.1.2, p.187) and during the review that electric furnaces account for less than 5 per cent of the total production of iron and steel in the country and, as confirmed during the review, the percentage is calculated using the total volume of iron and steel produced in the country and the volume produced by electric furnaces on the basis of data provided by CZSO. Of the total amount of CO_2 emissions, about 6 per cent are recycled in the process. The ERT noted that the explanation provided by the Party in the NIR does not clarify how emissions from recycled iron and steel are accounted for and whether the 6 per cent of emissions that are recycled is the contribution of emissions from recycled iron and steel of the total emission from iron and steel production emissions.
I.21	2.D.3 Other (non-energy products from fuels and solvent use) – CO_2 (I.25, 2021) Transparency	Explain in the NIR why 1998 has been chosen as the first year for which emissions from urea used as a catalyst are estimated for category 2.D.3 (other).	Resolved. The Party reported its NIR (section 4.5.3.2, p.196) that 1998 was chosen as the first year for which emissions from urea used as a catalyst are estimated for category 2.D.3 (other) because it was the year that urea application in diesel motors started in the country.
I.22	2.D.3 Other (non-energy products from fuels and solvent use) – CO_2 (I.25, 2021) Transparency	Specify in the NIR the purity factor used in estimating emissions from urea used as a catalyst.	Resolved. The Party reported in its NIR (section 4.5.3.2, p.196) that the purity factor used in estimating emissions from urea used as a catalyst is 32.5 per cent.
I.23	2.E.3 Photovoltaics – F-gases (I.26, 2021) Transparency	Provide information on the photovoltaics industry in Czechia in the NIR explaining why this industry does not produce any emissions.	Resolved. The Party reported in its NIR (section 4.6, p.198) that SF_6 and other fluorinated compounds are not used in the photovoltaics industry under category 2.E.3 (electronics industry – photovoltaics) according to the information provided by the producers. Emissions for category 2.E.3 were therefore reported as “NO”.

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I.24	2.E.4 Heat transfer fluid – F-gases (I.28, 2021) Transparency	Complete the investigation into the use of heat transfer fluid in the electronics industry and report on emissions associated with this source, and, if emissions for this category are reported as "NE", justify this in line with the UNFCCC Annex I inventory reporting guidelines.	Not resolved. Czechia has not estimated emissions for category 2.E.4 (electronics industry – heat transfer fluid), reporting "NE" across the time series without sufficient explanation provided (see ID# I.33 in table 5). During the review, the Party stated that it plans to investigate this category further and adjust reporting in its next submission and indicated that any potential emissions are below the significance threshold set in the UNFCCC Annex I inventory reporting guidelines (0.05 per cent of the national total GHG emissions and not exceeding 500 kt CO_2 eq) but has not provided information on the likely level of emissions. The ERT concluded that the justification should be clearly documented in the NIR along with the likely level of the emissions.
I.25	2.F Product uses as substitutes for ozone-depleting substances – F-gases (I.29, 2021) Transparency	Clearly report the recalculations applied for the relevant emission estimate time series in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party reported new and additional recalculations in its NIR for category 2.F.1.e (mobile air conditioning) (section 4.7.8, p.212), describing source-specific recalculations and the reasons behind them, including changes made in response to the review process and the impact on the emission trend between the 2021 and current submission (table 4-39, p.212).
I.26	2.F Product uses as substitutes for ozone-depleting substances – F-gases (I.29, 2021) Transparency	Clearly explain in the NIR the changes to the Phoenix model for estimating F-gas emissions, in particular changes relating to the assumption that recovered gases are reused.	Not resolved. The Party clarified during the 2021 review that the Phoenix model was modified to assume that recovered gases are used after decommissioning in other equipment, changing emission estimates from stocks and disposal. However, the NIR does not contain a clear explanation of the assumptions in the Phoenix model as provided during the previous review. During the review, the Party clarified that the amount of F-gas recovered and reused from an operating system is calculated using the difference between the amount remaining in the system and the actual emissions from disposal.
I.27	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (I.12, 2021) (I.15, 2019) (I.13, 2017) (I.16, 2016) (I.16, 2015) Transparency	Provide in the NIR an explanation of AD, customs statistics and data from the integrated system of mandatory reporting of the Ministry of the Environment in order to prove the completeness of the estimation of F-gas emissions from imported products.	Resolved. The Party reported in its NIR (section 4.7.1.2, p.203) that AD for the Phoenix calculation model are obtained from three different sources (the integrated system of mandatory reporting of the Ministry of the Environment, F-gas register and customs) and cover all sources of trade between Czechia and the world market. Importers, exporters and users of F-gases also voluntarily report amounts of consumed F-gases below the threshold, ensuring the completeness of the reporting. Annex A.3.7 to the NIR (pp.525–528) describes the system for ensuring the completeness and reducing the risk of double counting when using the different data sources, including the imported products.
I.28	2.F.1 Refrigeration and air conditioning – HFCs (I.13, 2021) (I.23, 2019) Transparency	Include in the NIR details of the information (e.g. vehicle age, level of implementation of HFC recovery from destroyed cars) and data provided by the main Czech car bazaar and explain how the data are used for estimating the HFC emissions.	Resolved. The Party reported in its NIR (section 4.7.1, pp.202–209) details of emissions from transport refrigeration and mobile air conditioning calculated based on tier 2a methodology. Czechia described in the NIR parameters used for calculations of emissions (table 4-34, p.205), the number of vehicles produced in the country in 2020 (table 4-35, p.206), lifetimes of vehicle types (table 4-34, p.205), its vehicle fleet (table 4-36, p.207), shares and type of refrigerant used (table 4-37, p.208) and emissions of HFCs and PFCs (table 4-38, p.209). The Party reported that data for emission estimates are obtained from

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			the Automotive Industry Association. These data contain the production figures for the Czech automobile industry since 1995 and emissions from filling new equipment, over the lifetime of the equipment and at the end of life. The percentage share of cars equipped with air conditioning is based on data from the main car bazaar and expert judgment.
I.29	2.F.1 Refrigeration and air conditioning – HFC-134a (I.30, 2021) Accuracy	Review the reported emissions and removals of HFC-134a for subcategory 2.F.1.b (domestic refrigeration) to ensure the accuracy of the reported values, review QC procedures to reduce the risk of future reporting errors and transparently document in the NIR any recalculations applied.	Resolved. The Party reviewed the category 2.F.1.b (domestic refrigeration) calculations and detected no errors in the application of Phoenix, the country-specific model; therefore, no recalculations were reported and no mention was made in the relevant section on recalculations in the NIR (section 4.7.8). The ERT did not identify any further accuracy-related issues.
I.30	2.F.4 Aerosols – HFC-134a and HFC-227ea (I.31, 2021) Convention reporting adherence	Review and revise the CRF table reporting arrangements for categories 2.F.4 (aerosols), 2.F.4.a (metered dose inhalers) and 2.F.4.b (other) and ensure emissions and removals are accurately and transparently reported consistently with the reporting in the NIR.	Resolved. The Party reported HFC-134a and HFC-227ea emissions in CRF table 2(II)B-Hs2 under subcategory 2.F.4.a (metered dose inhalers) and HFC-134a emissions for subcategory 2.F.4.b (other). The ERT noted the sum of emissions of HFC-134a and HFC-227ea reported under the subcategories of category 2.F.4 (aerosols) in CRF table 2(II).B-Hs2 matches the total emissions of each F-gas reported for category 2.F.4 (aerosols) in CRF table 2(II), which was not the case in the previous submission. The Party reported consistent data on emissions in the NIR (section 4.7.4, pp.210–211).
I.31	2.H Other (IPPU) – CO_2 (I.32, 2021) Transparency	Review and transparently document the calculation methodologies used to determine pulp and paper emissions, including how emissions have been determined in accordance with a methodology for other process uses of carbonates from the 2006 IPCC Guidelines (vol. 3, chap. 2, pp.2.32–2.35).	Addressing. The Party reported in its NIR (section 4.9.1, p.219) that CO_2 emissions from pulp and paper processes result from application of liquid CO_2 which is used for pH adjustment in the delignification process. However, no further methodological information was included in the NIR. During the review, the Party clarified that the emissions in this subcategory are calculated on the basis of a methodology for other process uses of carbonates in the 2006 IPCC Guidelines (vol. 3, chap. 2, equation 2.16 and pp.2.32–2.35). The pulp and paper producing company uses liquid CO_2 for pH moderation and then burns the bonded CO_2 in the boiler. The AD are the amount of liquid CO_2 used and are taken from the EU ETS.
I.32	2.H Other (IPPU) – CO_2 (I.32, 2021) Transparency	Explain how time-series consistency is maintained, noting the different AD sources for 2001–2009 and 2010–2019, and clearly document how emissions from the producer have been reported under multiple categories to demonstrate that no over- or under-reporting has occurred.	Addressing. The Party reported in its NIR (section 4.9.1, p.219) that there is only one company which uses liquid CO_2 application technology in the country. The data for 2010–2020 come from the EU ETS and those for 2006–2009 were obtained directly from the company. Material flow data provided by the company were used to correlate the figures from 1996, when the technology was implemented, to 2006. During the 2021 review, the Party stated that the same company produces $CaCO_3$ and sodium carbonate and that emissions from these production sources were reported under categories 2.A.4.d (desulfurization) and 2.A.4.b (other uses of soda ash). The 2022 NIR indicates that the reabsorption of CO_2 in the process was removed from the estimates under 2.A.4.d (see ID# I.5 above), removing the risk of underestimation of the emissions. During the review, the Party clarified that data from the EU ETS for 2010–2020 and data obtained directly from the producer for 2006–2009 show the consumption of liquid CO_2.

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			The missing data for 2001–2005 were calculated using surrogate parameters in line with the 2006 IPCC Guidelines (vol. 1, chap. 5.3.3.2, equation 5.2). The ERT considers that the recommendation has not yet been fully implemented, because there was no additional explanation in the NIR as to how the time series is maintained and how and if emissions from different processes from the same producer are allocated across the inventory in order to improve the transparency of the reporting.
Agriculture			
A.1	3. General (agriculture) – CH_4, N_2O and CO_2 (A.1, 2021) (A.30, 2019) Convention reporting adherence	Correct the errors in the NIR, ensure that an annual update is made of table headings and content, and incorporate specific QC procedures that result in up-to-date and consistent reporting in the NIR.	Resolved. The ERT notes that Czechia has corrected the inconsistency of cattle categories noted by the ERT during the 2021 review (2021 NIR, pp.235–236) and therefore the 10 categories listed in the 2022 NIR (pp.227–229) are internally consistent. The ERT did not detect any other inconsistencies in the NIR, so considers this issue resolved.
A.2	3. General (agriculture) – CH_4 and N_2O (A.2, 2021) (A.31, 2019) Transparency	Revise the presentation of the feeding and grazing situation in NIR table 5-6, presenting the information on an annual basis.	Resolved. The Party updated table 5-7 in its NIR (p.229), to present the time spent by cattle on pasture as a fraction of the whole year by subcategory of cattle.
A.3	3.A.1 Dairy cattle – enteric fermentation – CH_4 (A.5, 2021) (A.33, 2019) Transparency	Report in the NIR the results of the planned validation of the tier 2 EF for dairy cattle.	Addressing. The Party included in its NIR (section 5.2.1.6, pp.234–236) initial results of the validation work. The material included new estimated digestibility values for dairy cattle diets, based on nutrients required for specific milk yields and an empirical relationship between digestibility and fibre content. Czechia stated in its NIR (p.386, table 10-10) that revisions will be implemented in its next submission. During the review, the Party reported that the results of the validation work will likely lead to insignificant recalculations to the enteric fermentation EFs for dairy and non-dairy cattle. The ERT considers that the recommendation has not yet been fully implemented, as the validation work was completed too late for the results to be included in the current NIR.
A.4	3.A.1 Dairy cattle – enteric fermentation – CH_4 (A.6, 2021) (A.33, 2019) Consistency	If the planned validation of the tier 2 EF for dairy cattle (see ID# A.3 above) reveals inconsistencies in the time series, revise the calculation of the country-specific EF and recalculate the time series accordingly.	Resolved. The ERT considers that the previous recommendation is not applicable until the validation work referenced in ID# A.3 above is completed, at which point it will become clear whether or not inconsistencies in the time series of CH_4 emissions for category 3.A.1 exist.
A.5	3.B.1 Non-dairy cattle – N_2O (A.12, 2021) (A.36, 2019) Transparency	Include in the NIR details of the underlying parameters, including a reference to their sources, used in the tier 2 calculations to determine the N_2O emissions across the time series.	Addressing. In the 2021 and current NIRs Czechia provided additional details (2021 NIR section 5.2.2.2.3, tables 5-24–5-25, pp.251–252, and current NIR section 5.2.2.2.3, tables 5-27–5-28, p.245) of the underlying parameters, including a reference to their source (implementing decree 377/2013 Coll.), used in the calculations to determine the N_2O emissions for 2019 and 2020. In addition, in the current NIR the Party included a new

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			table (table 5-29, p.246) presenting the time series of Nex rates assumed for each livestock category, as requested in the review report on the 2021 submission. During the review, Czechia confirmed that the information listed above has been added to section 5.2.2.2.3 to address this recommendation. However, no detailed information was provided in the current NIR on the underlying method used to calculate Nex rates for 1990–2018, such as was provided in tables 5-25–5-28 (pp.241–242) of the 2020 NIR. The ERT considers that this issue has not been fully resolved because methodological information provided in the NIR should cover the methods used across the entire time series (see also ID# A.13 in table 5).
A.6	3.B.3 Swine – CH_4 (A.13, 2021) (A.15, 2019) (A.15, 2017) (A.25, 2016) (A.25, 2015) Accuracy	Consider swine a significant species for CH_4 emissions from manure and apply a tier 2 method to estimate CH_4 emissions from manure management for swine.	Resolved. The Party confirmed in its NIR (section 5.2.2.2.2, pp.242–244) that a tier 2 methodology has been used to estimate CH_4 emissions from manure management for swine across the entire time series. A sufficient level of documentation is provided for the parameters chosen and justification for the volatile solid excretion rates used in the NIR (section 5.2.2.2.2, pp.242–244 and section 5.2.2.4, p.250). During the review, Czechia provided the ERT with a spreadsheet demonstrating the underlying calculations of the tier 2 CH_4 EFs for swine (see issue ID# A.14 in table 5 concerning time series consistency of MMS manure allocations).
A.7	3.B.3 Swine – N_2O (A.14, 2021) (A.18, 2019) (A.30, 2017) Transparency	Provide a rationale for the decreases in TAM and Nex for swine in the NIR by explaining that they are mainly a consequence of the food market requirements for low-fat pork and by including any other relevant information.	Not resolved. The Party in its NIR (section 5.2.2.2) provided information on TAM for swine in 2020 in table 5-28 (p.245), and a time series of Nex for swine in table 5-29 (p.246). An explanation is provided in this section on the source of updated TAM values for 2018 and Nex and TAM values for 2019–2020, but there is no explanation for trends in Nex or TAM for 1990–2020, such as the reasons for the observed decrease in both Nex and TAM for 2005–2017 (see also issue ID# A.13 in table 5 concerning time-series consistency of Nex and TAM). During the review, the Party made a reference to NIR table 5.32 with an example of the derivation of the value of MMS and Nex for swine for 2020 with the support of data from implementing decree 377/2013 Coll. and explained that, according to available data and expert opinions, the decline in TAM and Nex earlier in the time series is due to the changes in market demands. The ERT considers that including an explanation for changes in TAM and Nex in 2005–2017 would be sufficient to resolve this issue.
A.8	3.D.a.5 Mineralization/ immobilization associated with loss/gain of soil organic matter – N_2O (A.18, 2021) (A.38, 2019) Transparency	Provide the correct value for the carbon to nitrogen ratio and all other underlying data used for estimating emissions from the mineralization of soil organic matter under cropland remaining cropland in the relevant section of the agriculture chapter of the NIR.	Resolved. The Party in its NIR section 5.4.2.2 on agriculture (pp.260–261) stated the correct default carbon to nitrogen ratio (10) in line with the 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.16) and included information on annual net CSC in soils on cropland remaining cropland in table 5-47, as well as a reference to the source for these numbers.

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A.9	3.D.b Indirect N_2O emissions from managed soils – N_2O (A.19, 2021) (A.23, 2019) (A.19, 2017) (A.13, 2016) (A.13, 2015) (63, 2014) (68, 2013) Accuracy	Improve the reporting of indirect emissions from soils by, for example, harmonizing the reporting of ammonia emissions to different international bodies or by using well-documented national data.	Addressing. There were no significant recalculations for this category since the 2021 submission (changes below 1.0 per cent). The Party in its NIR (section 5.4.6, pp.266–267) provided further information explaining the approach to harmonizing indirect N_2O emission estimates with United Nations Economic Commission for Europe reporting using a national N flow model and referred to the nutrient balance methodology published in 2021. However, the information from the nutrient balance was still not used in the inventory and the Party applied a tier 1 method with default EFs. Pending harmonization, the Party also provide in the NIR (table 5-53, p.267) a comparison of indirect N_2O emissions from atmospheric deposition using the current GHG methodology (which uses default values for the fraction of N lost through volatilization from synthetic fertilizers and the fraction of applied organic N fertilizer materials and of urine and dung N deposited by grazing animals that volatilizes as ammonia and nitrogen oxides from the 2006 IPCC Guidelines (vol. 4, chap. 11, table 11.3)), against those reported in the Czech nomenclature for reporting in accordance with the Convention on Long-range Transboundary Air Pollution. The ERT noted that the N_2O emission estimates are generally higher when using the methodology from the 2006 IPCC Guidelines, except for 2019, where different Nex data were used. During the review, Czechia explained that the harmonization process involves several stages and so it is not possible to predict when full implementation can take place, but an annex to the NIR in the next submission will describe progress on the harmonization activities in detail. The ERT considers that including information in the NIR on progress on the harmonization activities and use of the collected national data will help to resolve the issue.
A.10	3.D.b Indirect N_2O emissions from managed soils – N_2O (A.20, 2021) (A.29, 2019) Transparency	Improve the reporting on recalculations by clearly documenting and justifying all recalculations regarding N_2O emissions from the atmospheric deposition of nitrogen in the NIR in line with paragraph 45 of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party performed significant recalculations for indirect N_2O emissions from managed soils between its 2020 and 2021 submissions and minor recalculations in its 2022 submission. In its NIR (section 5.4.5), it provided the required additional information explaining the cause of the recalculations (changes to N inputs to soils) made in the submissions and the impact on indirect N_2O emissions in particular, in line with paragraph 45 of the UNFCCC Annex I inventory reporting guidelines. The ERT therefore considers this issue to be resolved.
A.11	3.D.b.1 Atmospheric deposition – N_2O (A.21, 2021) (A.25, 2019) (A.36, 2017) Convention reporting adherence	Include the use of a higher-tier method for the estimation of indirect N_2O emissions from atmospheric deposition in the inventory development plan, with a corresponding timetable (harmonization with the reporting under the Convention on Long-range Transboundary Air Pollution is suggested).	Resolved. The Party has included details in its NIR (section 5.4.6, pp.266–267) of the continuing work to move to a higher-tier method for the estimation of indirect N_2O emissions from atmospheric deposition. This improvement has also been included in the improvement plan for key categories presented in NIR table 10-10 (p.386), stating that the implementation of the solution for the issue is planned for the 2024 submission.

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A.12	3.G Liming – CO_2 (A.22, 2021) (A.39, 2019) Transparency	Include in the NIR further details on the data source (e.g. expert judgment) for the share of dolomite applied.	Resolved. The Party reported in its NIR (section 5.7.2, p.268) that the 90 per cent limestone and 10 per cent dolomite split for lime applied for 1990–2017 originates from an ERT recommendation (during the 2017 in-country review) (see ID# A.17 in table 5).
LULUCF			
L.1	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.2, 2021) (L.22, 2019) Consistency	Review all EFs and parameters associated with harvest emissions that may have changed due to the type of forest being harvested given the large changes that are currently being observed, revise the estimates if necessary and ensure the consistency of the reported time series.	Resolved. The Party implemented a tier 3 estimation approach for the whole time series using the Carbon Budget Model of the Canadian Forest Sector described in annex 3.6 (pp.508–524) to the NIR, including detailed matrices of FM interventions and disturbances related to harvesting (i.e. thinning, wildfire, salvage logging, final cut, slash and burn). Czechia also included in its NIR (section 6.4.1, p.284) an explanation of the recent significant changes associated with harvest emissions and, in section 6.4.2.2 (p.291), information on parameters (i.e. wood densities and carbon fraction) for each species associated with harvest emissions. Figure 6-12 (p.291) shows time-series data of harvest of merchantable volume by species group and by type of FM intervention.
L.2	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.12, 2021) Transparency	Transparently describe in the NIR the EFs and parameters associated with harvest emissions, including the assumptions and calculations underlying the rectified fraction of additional harvest, and how these components are calculated to obtain the total carbon loss from harvests.	Resolved. The EFs and parameters associated with harvest emissions (i.e. wood densities and carbon fraction) were described in the NIR (section 6.4.2.2, p.291) (see ID#L.1 above). The Party also enhanced its explanations in the NIR (section 6.4.1, p.284) for obtaining the total amount of woody drain, which is used for estimating the total carbon loss from harvests. Furthermore, Czechia included in its NIR (section 6.4.1, p.284) explanatory pictures to show that the rectified fraction (50 per cent for partitioning between merchantable and non-merchantable wood volume) that it uses for additional harvest is conservative.
L.3	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.12, 2021) Transparency	Demonstrate the consistency of the estimates of carbon loss from harvest over the entire time series by reporting the time-series data for harvest losses, and provide the basis for the assumed values of the parameters (i.e. 5 per cent for planned harvest, 15 per cent for salvage logging and 50 per cent for partitioning between merchantable and non-merchantable wood volume).	Addressing. The Party had reported its harvest loss over the entire time series by including figure 6-9 on harvest drain in the NIR (section 6.4.1, p.285). Czechia also included in its NIR (section 6.4.1, p.284) an explanation for the 50 per cent assumption for partitioning between merchantable and non-merchantable wood volume and the basis for the assumed values of other fractions (5 per cent for planned harvest and 15 per cent for salvage logging) (section 6.4.2.3, pp.294–297). However, the Party did not demonstrate how it ensured consistency of the harvest loss across the time series. During the review, Czechia clarified that consistency of the estimates of carbon loss from harvest is ensured by using the only official data source on merchantable harvest in the country (CZSO) for the average of 95 per cent of the total harvest volume, while the remaining part (5 per cent) of additional harvest (“unreported loss”) was mainly from harvest loss due to forest operations in situ and fractional unregistered removals by the owners of small forests. CZSO provides estimates for the remaining fraction for 2011 onward, and the consistency for the remaining part before 2011 was ensured by using expert estimation by the Institute of Forest Ecosystem Research Ltd. based on the known share of sanitary logging for each year. The ERT considered that the consistency for the remaining part was therefore ensured.

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			The ERT considers that the recommendation has not yet been fully addressed because the Party has not included in the NIR a description that shows consistency across the time series for the remaining part of harvest loss.
L.4	4.A.1 Forest land remaining forest land – CO_2 (L.4, 2021) (L.11, 2019) (L.14, 2017) Accuracy	Use the auxiliary data to estimate CSC in deadwood and litter, or review and document in the NIR the likely significance of the deadwood and litter pools.	Resolved. The Party adopted a tier 3 estimation approach using the Carbon Budget Model of the Canadian Forest Sector to estimate and report the CSC in deadwood and litter pools. The methodology was explained in the NIR (section 6.4.2.2, pp.291–292).
L.5	4.A.1 Forest land remaining forest land – CO_2 (L.5, 2021) (L.12, 2019) (L.14, 2017) Accuracy	Review and document in the NIR the likely significance of the soils pool.	Resolved. The Party adopted a tier 3 estimation approach to estimate and report the CSC in the mineral soil pool. The methodology was explained in the NIR (section 6.4.2.2, pp.291–292). The ERT also noted that the Party used the notation key "NO" for organic soils and explained in the NIR (p.292) and during the review that, although there are organic soils reported for forest land remaining forest land, no specific management practices are conducted in organic soils that cover protected peat areas in mountainous regions dominated by spruce. As the Party is not using tier 1 assumptions, but rather explained the lack of activities in the areas, the ERT concluded that the notation key was used correctly.
L.6	4.A.1 Forest land remaining forest land – CO_2 (L.6, 2021) (L.23, 2019) Convention reporting adherence	Revise the notation keys reported for the litter and soils pools in CRF table 4.A, noting that "NA" is to be reported in the CRF tables for the tier 1 assumptions provided in the 2006 IPCC Guidelines for carbon stocks in equilibrium.	Resolved. There are no notation keys reported for mineral soil and litter pools after the Party adopted a tier 3 estimation approach to report the CSC in dead organic matter. The methodology was explained in the NIR (section 6.4.2.2, p.292). The ERT noted that Czechia used the notation key correctly for emissions from organic soils (see ID#s L.4 and L.5 above).
L.7	4.A.1 Forest land remaining forest land – CO_2 (L.13, 2021) Transparency	Transparently describe the recalculations of CSC in deadwood, including the differences in the methodologies and data used, in order to explain the changes.	Resolved. The original recommendation requiring additional details on the recalculation of tier 2 approaches is not applicable to the newly adopted tier 3 estimation approach using the Carbon Budget Model of the Canadian Forest Sector for the deadwood pool. However, the Party included an explanation in its NIR (section 6.4.4.2, p.291) for the change in methodology, data and assumptions, and a description of the recalculation is provided in its NIR (section 10.1.1.4.1, p.371).
L.8	4.A.1 Forest land remaining forest land – CO_2 (L.14, 2021) Transparency	Provide information on national forest inventories in the NIR, including the plot size and number of sample plots, to allow for an assessment of the reliability of the data gathered on CSC in deadwood.	Resolved. The Party implemented a tier 3 estimation approach using the Carbon Budget Model of the Canadian Forest Sector for the deadwood pool which does not use data from the national forest inventory. Therefore, the recommendation from the previous review report no longer applies. See ID# L.10 in table 5 regarding the use of a tier 3 method for estimation of CSC in deadwood.
L.9	4.G HWP – CO_2 (L.11, 2021) (L.27, 2019)	Complete the data entry for CRF table 4.Gs2 by including the information for 1961–1989.	Resolved. The Party completed the data entry in CRF table 4.Gs2 by including the data for 1961–1989.

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	Convention reporting adherence		
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.14, 2021) Accuracy	Use the data from the new waste composition survey project to obtain data (e.g. using extrapolation) on historical changes in solid waste disposal and waste streams for the entire time series, while using the first-order decay method together with default data from the 2006 IPCC Guidelines to estimate the CH_4 emissions from MSW.	Resolved. The Party recalculated its CH_4 emissions for category 5.A (solid waste disposal on land) using revised data for 2012–2019 based on the waste composition survey project completed in 2021 (section 7.2.1.4, p.329) and reported in its NIR (section 7.2.2.1, pp.325–326) detailed data regarding the different waste streams for the entire time series used in the first-order decay method. The NIR provides a transparent explanation of the data sources and the procedures used (such as interpolation) for those years without country-specific data.
W.2	5.A Solid waste disposal on land – CH_4 (W.15, 2021) Transparency	Obtain data on industrial waste for the entire time series or, if that is not possible, use the appropriate data splicing techniques from the 2006 IPCC Guidelines (vol. 1, chap. 5, pp.5.8–5.14), such as the extrapolation method from the non-linear trend line, to obtain the data for the entire time series (1990–2003 and 2017 onward) and transparently present this information in the next annual submission.	Not resolved. The Party has not reported the amount of industrial waste separately and has explained in the NIR (section 7.2.2.1, p.325) that some of the waste categories required under category 5.A, including industrial waste, are not included as a separate category in ISOH. As Czechia still uses ISOH data, which contain industrial waste data but do not separate them out, the ERT noted that this does not lead to an underestimation of emissions because Czechia included the amount of industrial waste in the total amount of solid waste disposal on land. However, the assumptions used in the estimates for the industrial portion of waste were not presented or justified in the NIR. During the review, the Party shared with the ERT the IPCC waste model spreadsheets used, with the estimates of the industrial waste correction factor applied for industrial waste across the time series. Czechia further stated that the technique applied to estimate the amount of industrial waste for the entire inventory period would be completed and described in a transparent and detailed manner in the next submission.
W.3	5.A.1 Managed waste disposal sites – CH_4 (W.3, 2021) (W.6, 2019) (W.10, 2017) Accuracy	Compare the two data sources (the ISOH database and Eurostat) as a verification analysis to confirm that the AD reported in the annual submission are complete.	Resolved. The Party reported in its NIR (section 7.2.1.1, p.324) that for the purpose of the inventory its uses ISOH data because they are evidence-based and verified by the Czech Environmental Information Agency. Czechia reported in its NIR (section 7.2.1.1, pp.323–324) a comparison of data from Eurostat and ISOH for 2010–2018 on the amount of waste produced in the country (table 7-4) and amount of waste disposed of at SWDS (table 7-5). The comparison shows the higher ISOH values for the AD as used in the estimates, ensuring the completeness of the inventory. The Party also reported that the difference between data from Eurostat and ISOH is caused by differences in data-collection methods and other methodological approaches, and therefore no further detailed comparative analysis could be carried out.
W.4	5.A.1 Managed waste disposal sites – CH_4 (W.4, 2021) (W.6, 2019) (W.10, 2017) Transparency	Include the results of the verification of the data from ISOH in the NIR.	Resolved. The Party reported in its NIR (section 7.2.1.1, p.324) that ISOH data are used for the inventory because they are evidence-based and verified by the Czech Environmental Information Agency. In 2018, the Czech Environmental Information Agency ran a comparison of SWDS data from ISOH and CZSO, and concluded that ISOH data were a better fit regarding fees and levies gathered in the waste management

ID#	Issue/problem classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
			sector and therefore perceived as more accurate. Examples of comparisons of ISOH data and data from CZSO (used by Eurostat) are shown in figures 7-4 and 7-5 (p.324) of the NIR. The Party also stated that it has tried to verify data on landfilling by cross-checking with the State Treasury (waste levies) and concluded that they match with reported landfilled waste (with up to 3 per cent difference in selected cases).
W.5	5.A.1 Managed waste disposal sites – CH_4 (W.5, 2021) (W.7, 2019) (W.11, 2017) Accuracy	Provide in the NIR a description of the investigation of the share of sewage sludge disposal streams related to the data from ISOH, including verification by comparing with Eurostat data. If there is sewage sludge disposal to solid waste disposal sites in the country, estimate and report CH_4 emissions from sewage sludge disposal.	Addressing. The Party did not report sludge in NIR table 7-3 (section 7.2.1.1, p.326) as a waste stream which might be deposited in landfills, although some small amounts of sludge might end up in landfills. Czechia has reported that sludge deposited as waste is included in the total amount of waste in landfill, which means that the emissions should not be underestimated because the mass deposited in landfills does include sludge (the data are bottom-up total mass data for landfills) and the average degradable organic carbon obtained using the current waste mixture is larger than the default value for sludge. The Party also reported that more detailed insight into this issue is planned. During the review, Czechia confirmed that it uses bottom-up data on disposal (not usage), so sludge is already included in the estimates of the category. The ERT concluded that the approach applied by the Party ensures that there is no underestimation of the emissions from the category. However, the ERT considers that the recommendation has not yet been fully addressed because the Party has not provided in the NIR a description of the share of sewage sludge in the waste disposal at SWDS, affirming that CH_4 emissions from sludge are included in the estimates.
W.6	5.B Biological treatment of solid waste – CH_4 and N_2O (W.6, 2021) (W.8, 2019) (W.12, 2017) Completeness	Implement the improvements planned for this category, namely: (a) Estimating emissions from composting for before 2005 and from household compost; (b) Reviewing the data sources for emissions before 2007; (c) Verifying the factor used for estimated leakages from digestion facilities.	Addressing. The Party implemented part of the planned improvements as follows: (a) Addressing. Czechia has not included any estimates for 1990–2004 and explained in its NIR (section 7.3.1.2, p.330) that no data are available for category 5.B.1 (composting) before 2005, but research is being carried out to determine the reasons for this. During the review, the Party clarified that the project to improve category 5.B.1 (composting) by including household composting is continuing and is likely to be finalized at the end of 2022 or beginning of 2023. Czechia, however, considers that the results may not be sufficiently representative and could introduce significant bias into the emission estimates. In that case, the Party will apply the appropriate data splicing techniques recommended in the 2006 IPCC Guidelines (vol. 1, chap. 5) to obtain the data for 1990–2004; or will estimate the emissions based on the regional default data on composting provided in the 2006 IPCC Guidelines (vol. 5, chap. 2, table 2.1). Czechia stated that it will not make a definitive estimate until the completion of the current project. (b) Resolved. The Party reported in its NIR (section 7.3.2.2, pp.331–332) that the Ministry of Industry and Trade monitored the amount of biogas and additional data for the entire inventory period, including before 2007. (c) Resolved. The Party verified the factor used for estimated leakages from digestion facilities. It clarified in its NIR (section 7.3.2.2, pp.331–332) that a mean value of 5 per

ID#	Issue/problem classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
			cent for all CH_4 produced was used for estimation of the emissions of biogas from AD, which is in line with the 2006 IPCC Guidelines (vol. 5, chap. 4.1, p.4.4) (default range of 0–10 per cent). Czechia reported plans to create a country-specific value for the leakages in the future.
W.7	5.B Biological treatment of solid waste – CH_4 and N_2O (W.16, 2021) Completeness	Make efforts to obtain data on waste composting for 1990–2004; or, if that is not possible, use the appropriate data splicing techniques from the 2006 IPCC Guidelines (vol. 1, chap. 5) (e.g. extrapolation method from the non-linear trend line) to obtain the data for 1990–2004; or estimate the emissions on the basis of the regional default data on composting provided in the 2006 IPCC Guidelines (vol. 5, chap. 2, table 2.1).	Addressing. The Party has not included any AD or estimates on composting for 1990–2004 and reported in its NIR (section 7.3.1.2, p.330) that no data are available for this category before 2005, but research is being carried out to identify potential AD. During the review, Czechia clarified that the project to improve category 5.B.1 (composting) by including household composting is continuing (see ID# W.6 above). The application of a specific method for determining and refining emissions for category 5.B.1 (based either on AD identified in the continuing research or on the appropriate data splicing techniques recommended in the 2006 IPCC Guidelines (vol. 1, chap. 5) or according to the regional default data on composting provided in the 2006 IPCC Guidelines (vol. 5, chap. 2, table 2.1.)) will be chosen after the finalization and evaluation of the project. The ERT considers that the recommendation has not yet been fully addressed because the Party has not estimated or included in the NIR any AD or emission estimates from composting for 1990–2004.
W.8	5.C.1 Waste incineration – CO_2, CH_4 and N_2O (W.8, 2021) (W.17, 2019) Transparency	Include in the NIR all recalculations made, together with detailed explanations.	Resolved. Although the Party has not implemented any recalculations for category 5.C.1 (waste incineration) in its current submission, it has included in the NIR specific sections entitled “source-specific recalculations, including changes made in response to the review process” for each category where detailed information about recalculations has been included, stating that no recalculations were made for the category (section 7.4.1.5, p.339). Czechia has included detailed information in section 7.4.1 (pp.334–339) of the NIR regarding emissions from the category, which have been reported separately by type of waste and by gas (table 7-14) for the entire time series (1990–2020).
W.9	5.C.1 Waste incineration – CO_2 (W.9, 2021) (W.18, 2019) Accuracy	Make an effort to report emissions for the different waste types separately. If this is not possible, provide information in the NIR on the specific types of waste incinerated and their estimated shares, including justification for using the default parameters for industrial waste instead of specific parameters for industrial, clinical and fossil liquid waste.	Resolved. The Party reported in NIR tables 7-12–7-14 (pp.335–338) the specific parameters used for the different types of waste incinerated (e.g. clinical and industrial waste), as well as the kt of waste incinerated and GHG emissions by type of waste across the entire time series (1990–2020). The disaggregated information is also provided in CRF table 5.C. Czechia has reported hazardous waste using notation key “IE” and explained in the NIR (section 7.4.1.2, p.334) that no category of hazardous waste has been reported because, under national legislation, it is a part of each of the four other categories of waste, namely industrial, sludge, MSW and clinical. The Party has also included the data sources used for all parameters and has explained the methodology used to derive data before 2005.
W.10	5.D.1 Domestic wastewater – CH_4 (W.11, 2021) (W.14,	Justify in the NIR the selection of MCFs for the three streams of domestic wastewater	Addressing. The Party provided a justification for the selection of the three streams of domestic wastewater treatment (uncollected TOW, untreated TOW and treated TOW), including a tabular overview of the MCF values used in its NIR (section 7.5.1.2, table 7-

ID#	Issue/problem classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
	2019) (W.15, 2017) Transparency	treatment (uncollected TOW, untreated TOW and treated TOW).	21, pp.344–345). The revisions of the MCF for uncontrolled and treated wastewater and the recalculated emissions are also included in the NIR (section 7.5.1.5, table 7-25, p.347). However, there is no information about the data source used nor any explanation as to how the country-specific values have been estimated. During the review, Czechia clarified that MCF values have been updated since the 2021 submission to reflect the national conditions (e.g. 13 per cent of the wastewater treatment plants not being well managed) and has clarified how the country-specific values have been obtained. The Party also clarified during the review that a detailed description of the MCFs will be added in next submission. The ERT considers that the recommendation has not yet been addressed because the Party has not included in the NIR any information about the data source used nor any other relevant information explaining how the country-specific MCFs have been obtained.
W.11	5.D.1 Domestic wastewater – CH_4 (W.12, 2021) (W.15, 2019) (W.16, 2017) Accuracy	Provide in the NIR information justifying the use of a constant ratio for biogas reduction prior to 2002.	Not resolved. The Party continues to report a constant value for biogas reduction (fraction of treated TOW) prior to 2002 in NIR table 7-21 (pp.344–345). However, there is no justification provided for using the same values or information as to which gap-filling technique has been used, in line with the 2006 IPCC Guidelines (vol. 1, chap. 5.3). During the review, Czechia clarified that there are no AD prior to 2002, but recovery did occur owing to technical regulations in the country. The ERT noted, however, that the Party has not used proper extrapolation techniques to estimate the values, as recommended by the 2006 IPCC Guidelines (vol. 1, chap. 5.3).
KP-LULUCF			
KL.1	Deforestation – CO_2 (KL.2, 2021) (KL.7, 2019) (KL.3, 2017) (KL.2, 2016) (KL.2, 2015) (87 and 89, 2014) (94, 97 and 98, 2013) Accuracy	Improve the tracking of deforested land, including information on subsequent land-use change and the management practices applied to them.	Resolved. The Party reported in its NIR (section 12.2.4, p.422) that the interim analysis showed that improved tracking of deforested land would not lead to any difference in quantified emission estimates beyond estimation error. During the review, the Party provided information on its analysis which was carried out using the available data layers for 2013, 2017 and 2020, which showed a potential reforestation of deforested areas might have occurred on less than 1 per cent of the quantified area. Such cases would result in an increase in living biomass. The ERT also noted that over 75 per cent of the deforestation led to a land-use change to settlements. On the basis of this information, the ERT agrees with the Party that improved tracking of deforested land would have negligible impact and would not lead to underestimation of emissions from the activity.
KL.2	FM – CO_2 and N_2O (KL.5, 2021) (KL.11, 2019) (KL.14, 2017) KP reporting adherence	Provide information to demonstrate consistency between the FMRL and the reporting of FM, for example by including in the NIR a table comparing the historical time series used in the construction of the FMRL and the reported emissions for the same	Resolved. The Party recalculated its FMRL to ensure methodological consistency between FMRL and FM reporting and provided explanations in its NIR (section 12.5.3.3, pp.432–433, and section 12.6.2, p.437) as to how inconsistencies in the methodologies used and the inclusion of the carbon pools and AD to estimate the total FM emissions were corrected. Czechia also provided each amount of corrected carbon inflow and harvest quantities for $FMRL_{corr}$ (NIR table 12-5, p.434).

ID#	Issue/problem classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
		historical period from the latest annual submission.	
KL.3	FM – CO_2 and N_2O (KL.6, 2021) (KL.12, 2019) (KL.14, 2017) Transparency	Increase the transparency of the demonstration of the methodological consistency between FM and the FMRL by providing additional information on the main drivers of the accounting quantities for FM, in accordance with the Kyoto Protocol Supplement (chap. 2.7.5.2), for example if the increased sink in 2013, 2014 and 2015 relative to the FMRL is caused by a lower harvest rate than applied in the FMRL projection or by a different driver.	Resolved. The Party reported in its NIR (section 12.5.6, p.436) information on the main drivers of the accounting quantities observed in the recent emissions from FM activity (e.g. harvest loss) in accordance with the Kyoto Protocol Supplement (chap. 2.7.5.2). Czechia also provided the time-series data for the main drivers, including the recent significant changes in its harvested amount (figure 12-11, p.433) and included data explaining the change between FMRL and $FMRL_{corr}$ for these AD in the same figure.
KL.4	FM – CO_2, CH_4 and N_2O (KL.7, 2021) (KL.13, 2019) (KL.16, 2017) Accuracy	Review the checklist in table 2.7.1 of the Kyoto Protocol Supplement and calculate and report a technical correction to ensure methodological consistency between the FMRL and the reporting on FM in the second commitment period.	Resolved. The Party reported in its NIR (section 12.5.3.3, pp.432–434) $FMRL_{corr}$ with a detailed explanation of how the technical correction is calculated to ensure methodological consistency between the FMRL and the reporting on FM in the second commitment period.
KL.5	FM – CO_2, CH_4 and N_2O (KL.9, 2021) (KL.17, 2019) Accuracy	Review all EFs and parameters associated with harvest given the large changes to the type of harvesting that are being observed.	Resolved. The issue was addressed by the transition to a tier 3 estimation approach using the Carbon Budget Model of the Canadian Forest Sector described in annex 3.6 (pp.508–524) to the NIR (see ID# L.1 above). The significant changes observed were in harvest loss caused by salvage logging.
KL.6	FM – CO_2, CH_4 and N_2O (KL.11, 2021) KP reporting adherence	Demonstrate the consistency between the FMRL and the reporting of FM in the commitment period by performing a technical correction to the FMRL to address the methodological changes made in the reporting in the commitment period, including in the treatment of the deadwood, litter and soil carbon pools.	Resolved. The Party recalculated its FMRL to assure methodological consistency between FMRL and FM reporting, and provided explanations in its NIR (section 12.5.3.3, pp.432–433, and section 12.6.2, p.437) on the calculated technical correction to the FMRL to address the methodological changes in deadwood, litter and soil carbon pools.
KL.7	HWP – CO_2 (KL.10, 2021) (KL.14, 2019) (KL.7, 2017) (KL.8, 2016) (KL.8, 2015) Transparency	Extend the part of the NIR that describes the development of the FMRL and HWP, for increased transparency.	Resolved. The Party described the development of FMRL and HWP reporting and recalculated its FMRL to ensure methodological consistency for the HWP pool between FMRL and FM reporting, and provided explanations in its NIR (section 12.5.3.3, p.433) as to how the inconsistencies in the AD used were addressed. During the review, Czechia provided further detailed information on changes in the AD caused by revised estimated harvest rates and by the updated AD on HWP of the Food and Agriculture Organization of the United Nations, which are all revised in the $FMRL_{corr}$ calculation.

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

[b] The report on the review of the 2020 annual submission of Czechia was not available at the time of this review. For the same reason, 2018 is also excluded from the list of review years in which issues could have been identified.

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

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

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

ID#	*Previous recommendation for issue*	*Number of successive reviews issue not addressed*[a]
General		
G.2	Improve the documentation on how qualitative information (e.g. expert judgment) on key parameters (e.g. the parameters used in the uncertainty analysis) is generated and improve the archiving of this information in order to improve transparency.	4 (2017–2022)
Energy		
E.1	Either ensure that the energy balance information provided in the NIR matches the data reported in the CRF tables or include an explicit statement in the NIR explaining that the information provided has not been used in the inventory.	3 (2019–2022)
E.12	Change the notation key for oil exploration to “NE” and indicate in both the NIR and the CRF completeness table why those emissions or removals have not been estimated.	5 (2015/2016–2022)
E.20	Report consistent information for bunker fuels between CRF tables 1.A(b) and 1.D, or, if this cannot be done, clearly explain any discrepancies in the NIR.	3 (2019–2022)
IPPU		
I.4	Collect the missing AD for 1990–2006 on mineral wool production and estimate and report CO_2 emissions.	5 (2015/2016–2022)
I.14	Explore the possibility of obtaining additional data directly from the plant (e.g. operating conditions, AD, abatement technology) in order to increase the accuracy of the EF used and the N_2O emissions reported.	4 (2017–2022)
Agriculture		
A.3	Report in the NIR the results of the planned validation of the tier 2 EF for dairy cattle.	3 (2019–2022)

ID#	*Previous recommendation for issue*	*Number of successive reviews issue not addressed*[a]
A.5	Include in the NIR details of the underlying parameters, including a reference to their sources, used in the tier 2 calculations to determine the N_2O emissions across the time series.	3 (2019–2022)
A.7	Provide a rationale for the decreases in TAM and Nex for swine in the NIR by explaining that they are mainly a consequence of the food market requirements for low-fat pork and by including any other relevant information.	4 (2017–2022)
A.9	Improve the reporting of indirect emissions from soils by, for example, harmonizing the reporting of ammonia emissions to different international bodies or by using well-documented national data.	7 (2013–2022)
LULUCF	No issues identified.	
Waste		
W.5	Provide in the NIR a description of the investigation of the share of sewage sludge disposal streams related to the data from ISOH, including verification by comparing with Eurostat data. If there is sewage sludge disposal to solid waste disposal sites in the country, estimate and report CH_4 emissions from sewage sludge disposal.	4 (2017–2022)
W.6	Implement the improvements planned for this category, namely estimating emissions from composting for before 2005 and from household compost.	4 (2017–2022)
W.10	Justify in the NIR the selection of MCFs for the three streams of domestic wastewater treatment (uncollected TOW, untreated TOW and treated TOW).	4 (2017–2022)
W.11	Provide in the NIR information justifying the use of a constant ratio for biogas reduction prior to 2002.	4 (2017–2022)
KP-LULUCF	No issues identified.	

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

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

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

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

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
General			
G.10	QA/QC and verification	The Party reported details of its QA/QC and verification plan, and approach to implementing routine QC procedures and activities, in its NIR (section 1.2.3, pp.23–40, and annex A5.5, pp.543–550), including descriptions of sectoral roles and specific checklists applied. However, the ERT noted that there are still some mistakes in the submitted information, such as inconsistencies between the NIR and the CRF tables (see ID#s E.1, E.20 and I.10 in table 3) and errors in reporting in the CRF tables (e.g. the errors in the additional information in CRF table 3.As2: (i) the feeding situation for dairy and non-dairy cattle (row 8 of table 3.As2) is reported as 0.15 and 45.44, respectively, whereas a text description (e.g. "pasture and stall") is expected in these cells aligning with the definitions provided in the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10.5); (ii) the gross energy intake (row 13 of table 3.As2) is reported as "IE", instead of repeating the numbers reported in column C of table 3.As1), as well as typographical errors (e.g. 2014 instead of 2020 on page 20 of the NIR)). During the review, Czechia acknowledged that there have been QC issues with its recent submission and stated that any errors will be fixed in its next submission. The Party also noted that it aims to continue its QA/QC meetings with Slovakian, Hungarian and Polish inventory experts (once also attended by Austrian experts). The process, which has been especially valuable for QA, verification and development of individual sectors, has been disrupted as a result of the coronavirus disease 2019 pandemic, but a virtual QA/QC meeting is scheduled for the third quarter of 2022 with Slovakian inventory experts, and in-person meetings are scheduled for 2023. A QA/QC handbook for sector experts will be created based on the discussions of sector experts from the past three years and will be particularly valuable for new experts joining the inventory team. The handbook will be introduced to sector experts at the QA/QC meeting in 2023. The ERT commends the Party for its efforts to update and enhance implementation of the QA/QC procedures and encourages it to continue this work and reflect significant updates to the QA/QC procedures in future submissions.	Not an issue/problem
Energy			
E.21	1.A.3.a Domestic aviation 1.A.5.b Mobile – liquid fuels – CO_2, CH_4 and N_2O	To estimate aviation emissions for categories 1.A.3.a (domestic aviation) and 1.D.1.a (international civil aviation) in its current submission, Czechia used EFs for CO_2, N_2O and CH_4 for instrument flight rules flights based on the EUROCONTROL database, and the IEFs of jet kerosene for these two categories reported in the respective CRF tables are as follows: 72.75 t CO_2/TJ, 4.94 kg CH_4/TJ and 1.98 kg N_2O/TJ. The recalculations in the current submission affected all EFs, and while the CO_2 and N_2O EFs remain comparable with those reported by other Parties, the CH_4 IEF for jet kerosene was revised from the previously reported value of 0.5 kg/TJ to values within the range of 4.92–5.00 kg/TJ for 1990–2020 (e.g. an increase of 888.45 per cent in 2019), which are outside the range of the IPCC default values (0.215–1 kg/TJ). For 2020, the reported value (4.94 kg/TJ) is the highest of all reporting Parties (0.28–4.44 kg/T, excluding Czechia). In addition, Czechia reported in its NIR (section 3.2.20, p.130) the use of a default CO_2 EF to estimate emissions from jet kerosene combustion for category 1.A.5.b.i (mobile (aviation component)), with a value of 71.50 t CO_2/TJ, along with country-specific EFs used to estimate CH_4 and N_2O emissions, with values of 14.38 kg CH_4/TJ and 10.26 kg N_2O/TJ. Although the ERT believes that it is possible that there is a difference between the engines of the aircraft considered under category 1.A.3.a (domestic	Yes. Accuracy

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue/problem?[a]
		aviation) and those considered under category 1.A.5.b.i, it considers that the differences in the IEFs, which were not explained in the NIR, are significant. During the review, Czechia explained that, for category 1.A.3.a, it used the new EFs for CH_4, CO_2 and N_2O based on EUROCONTROL data. The Party stated that, as there are zero values for CH_4 emissions for instrument flight rules cruise flights in these data, the CH_4 EF for landing and take-off of instrument flight rules flights was used. Czechia plans to reconsider the CH_4 EF for the next submission and also explained that it is completing a project analysing the possibility of using EFs and NCVs similar to those used in EUROCONTROL for category 1.A.5 (other) as used to estimate jet kerosene consumption emissions in category 1.A.3.a. The ERT recommends that the Party report in the NIR the verification carried out for the country-specific EFs based on EUROCONTROL data used in its current submission, ensuring their accuracy and applicability, in particular regarding the CH_4 EF. The ERT further recommends that the Party study the feasibility of applying in the estimates of category 1.A.5.b.i (mobile (aviation component)) the EFs used in the estimates of emissions of categories 1.A.3.a (domestic aviation) and 1.D.1.a (international civil aviation), ensuring methodological consistency across the three categories, and report in the NIR on any remaining differences in the methodologies and applied EFs across these categories.	
E.22	1.B.1.a Coal mining and handling – CH_4	Czechia stated in the NIR (section 3.3.1.1.1, p.135) that abandoned underground mines are located in Kladno Basin (near Kladno, 30 km north-west of Prague), the Ostrava-Karvina coalfield (North Moravia) and near Dolní Jiříkov (Koh-i-Noor mine) in North Bohemia, specifying that in terms of CH_4 emissions only the abandoned mines in the Ostrava-Karvina coalfield are relevant and included in the inventory. Coal mining in the Kladno Basin, which terminated in 2002, was not considered a source of CH_4. The ERT considers that the NIR does not clearly explain the reason for the absence of CH_4 emissions from the Kladno Basin and Koh-i-Noor mines. During the review, the Party explained that it had contacted the representatives of the company which manages the Kladno Basin and Koh-i-Noor mines and confirmed that the mines are completely flooded, thus justifying the absence of CH_4 emissions from the abandoned underground mines. The ERT recommends that the Party explain in the NIR that Kladno Basin and Koh-i-Noor mines are fully flooded, therefore no CH_4 emissions are estimated for those mines.	Yes. Transparency
E.23	1.B.2.b Natural gas – CH_4	The ERT identified a significant inter-annual decline in the trend of CH_4 emissions for category 1.B.2.b.5 (natural gas – distribution), a decrease of about 14.3 per cent corresponding to about 2.70 kt CH_4 between 2011 and 2012. Czechia presented in NIR table 3.61 (pp.154–155) the parameters used in the model that calculates CH_4 emissions in the category for 2020. However, the information provided in the NIR regarding the parameters used in the modelling of fugitive emissions in the distribution of natural gas is insufficient to explain the reasons for the significant decline in the trend of CH_4 emissions. During the review, Czechia explained that the parameter that most contributed to the differences between 2011 and 2012 was the length of the distribution network. Czechia used data directly from distribution companies for 1990–2011 and from the national Energy Regulatory Office yearbook for 2012–2020. In 2011, the distribution network length was calculated as 60,425 km, but only 48,253 km in 2012. The Party also explained that it intends to recalculate emissions for 2005–2010 in order to better reflect the development of the distribution network.	Yes. Consistency

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
		The ERT recommends that the Party review the parameters used in the model that calculates CH_4 emissions related to the distribution of natural gas, and, if necessary, recalculate CH_4 emissions from natural gas distribution for 2005–2011, ensuring consistency between the different data sources used.	
IPPU			
I.33	2.E.4 Heat transfer fluid – F-gases	The Party reported "NE" for the emissions for category 4.E (heat transfer fluid) (see ID# I.24 in table 3) in CRF table 2(II)B-H for the unspecified mix of HFCs and PFCs, whereas in the NIR (section 4.6.1, p.198) it stated that under category 2.E (electronics industry), only subcategory 2.E.1 (integrated circuit or semiconductor) is relevant for the country. There is no separate information on subcategory 2.E.4 included in the IPPU chapter of the NIR. Table 10-7 (p.377) on implications of recalculations indicates "NO" for subcategory 2.E.4. Table A5.7 (p.553) on completeness and CRF table 9 indicate that the estimates are not included since no reliable data are available and the emissions are expected to be negligible. However, the Party has not provided information on the level of insignificance expected for the subcategory in line with paragraph 37(b) of the UNFCCC reporting guidelines. During the review, the Party explained that the only producer of semiconductors in the country has now declared that it does not use F-gases as heat transfer fluids. Czechia is planning to conduct further research in this category and include more information in its next submission. The ERT recommends that the Party improve the reporting on subcategory 2.E.4 (heat transfer fluid) by including a separate section on it in the NIR, including justification of the notation key used, and ensure consistency of reporting between the CRF tables and the NIR.	Yes. Transparency
Agriculture			
A.13	3. General (agriculture) – CH_4 and N_2O	Section 5.2.2.2.3 (pp.244–247) of the NIR describes how new country-specific data available from analysis undertaken as part of implementing decree 377/2013 Coll. are used to provide more accurate estimates of Nex for all animal categories for 2019 and 2020. CRF table 3.B(b) and the clarifications by Czechia during the review show that TAM values given in decree 377/2013 Coll. have been used for 2018–2020. These new data sources were introduced in the 2020 and 2021 inventory submissions. However, the ERT notes that no recalculation of the historical time series of Nex or TAM has been undertaken when including the new data, which has led to a substantial discontinuity in Nex values between 2018 and 2019 and in TAM between 2017 and 2018 for all livestock species. It is unclear why the new TAM data have been introduced one year earlier in the time series than the new Nex data, and the ERT notes that for some livestock species such as goats and horses, this has led to a spike in Nex values in 2018 (compared with both 2017 and 2019) when the new higher TAM estimates are combined with the tier 1 default Nex values from table 10.19 in the 2006 IPCC Guidelines (vol. 4, chap. 10). The ERT considers that this does not reflect good practice in ensuring time-series consistency as set out in the 2006 IPCC Guidelines (vol. 1, chap. 5). Nex and TAM influence emissions from a range of agricultural source categories including 3.A (enteric fermentation where tier 2 is used (cattle)), 3.B (manure management) CH_4 emissions where tier 2 is used (cattle and swine), 3.B (manure management) N_2O emissions for all livestock, 3.D.a.2.a (animal manure applied to soils), 3.D.a.3 (urine and dung deposited by grazing animals) and 3.D.b (indirect N_2O emissions from agricultural soils). During the review, Czechia explained that the decision to implement the new country-specific Nex estimates from 2019 onward was taken to ensure consistency with reporting of the national N balance to Eurostat, and that the	Yes. Consistency

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
		Party considers implementing a gradual Nex change within the time series at a constant Nex rate per unit of mass would have implications for the time series of TAM for individual categories of animals. Czechia clarified that historical data on TAM for goats and horses in particular are unreliable, and it plans to revise the time series of TAM for goats for 1990–2017 in its next submission. The ERT notes that TAM is part of the calculation when applying a tier 1 approach to estimating Nex, and therefore the time-series consistency of Nex and TAM should be considered together. The ERT considers that the country-specific Nex and TAM values used for 2019–2020 and 2018–2020, respectively, are likely to be more accurate than values for earlier in the time series. For the livestock species with the highest N_2O emissions in 2020 (cattle, swine and poultry), the Nex values prior to 2019 are similar (for poultry) or higher (for cattle and swine) than the ones used for 2019–2020. The ERT noted that in line with decision 20/CMP.1, annex, paragraph 12, adjustments should not be retroactively applied for any year preceding the inventory year subject to review, except in cases where these are recalculated. In the 2022 submission, no recalculations were undertaken to Nex for inventory years prior to 2019, and therefore this issue was not included in the list of potential problems and further questions raised. Moreover, the ERT also noted that, had the new Nex values from decree 377/2013 Coll. been applied across the whole time series, for cattle in 2018 direct N_2O emissions from manure management would have been 19.4 and 19.6 kt CO_2 eq lower for dairy and non-dairy cattle, respectively. The ERT recommends that Czechia revise the Nex and TAM estimates for 1990–2018 to ensure consistency with the country-specific estimates for 2019 and 2020, and document progress in its NIR. Updating the Nex and TAM estimates may lead to recalculations for 3.A (enteric fermentation where tier 2 is used (cattle)), 3.B (manure management) CH_4 emissions where tier 2 is used (cattle and swine), 3.B (manure management) N_2O emissions for all livestock, 3.D.a.2.a (animal manure applied to soils), 3.D.a.3 (urine and dung deposited by grazing animals) and 3.D.b (indirect N_2O emissions from agricultural soils).	
A.14	3.B Manure management – CH_4 and N_2O	The Party reported in its NIR (tables 5-15–5-17, pp.238–239) a time series of manure allocation to different management systems, which reflects the revision of the MMS across the time series and the introduction of the anaerobic digesters conducted in the 2021 submission. The ERT noted that there are large discrepancies evident in these time series. For cattle, swine and poultry, a large shift is observed between 2015 and 2016 (e.g. for dairy cattle, anaerobic digesters increase their share from 0 to 32.5 per cent, while liquid and solid systems reduced their share from 27 to 10.7 per cent and from 65 to 56.8 per cent respectively and pasture, range and paddock were removed as an MMS) and for other livestock between 2013 and 2014 (e.g. from 2 to 50 per cent share for solid MMS for sheep), in both cases owing to the adoption of the results of country-specific studies for which references were provided in the NIR (p.237). These shifts cause step changes in the time series of direct N_2O emissions from manure management for all livestock categories, and of CH_4 emissions from manure management for livestock where a tier 2 approach is used (dairy cattle, non-dairy cattle and swine). The ERT reviewed the values used in the most recent years and found them well documented and justified; however, the reasons for the changes in the manure allocation across the time series are not justified in the NIR, apart from the reference to updated studies. The ERT considers that this does not reflect good practice in ensuring time-series consistency as set out in the 2006 IPCC Guidelines (vol. 1, chap. 5).	Yes. Consistency

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue/problem?[a]
		During the review, Czechia agreed that such step changes do not reflect the actual development of manure handling in the country and so it plans to revise the historical time series of manure allocation to different systems in its next submission. The ERT recommends that the Party revise the historical time series of manure allocation to different MMS for 1990–2015 for cattle, swine and poultry, and for 1990–2013 for other livestock categories, such that the assumptions used in the inventory accurately reflect the timing of shifts in manure management, given available data and expert judgment.	
A.15	3.B.3 Swine – N_2O	On the basis of data reported in CRF table 3.B(b) for 1990–2018, the ERT notes that a Nex rate of 0.68 kg N per 1,000 kg animal mass per day has been used to calculate Nex from swine, which is one of the parameters influencing estimates of N_2O emissions from manure management. According to table 5-28 (NIR, p.242), the source of this value is the default value in table 10.19 of the 2006 IPCC Guidelines (vol. 4, chap. 10). However, the ERT noted that 0.68 kg N per 1,000 kg animal mass per day is not the default value for swine in the latest revision of the 2006 IPCC Guidelines, but rather 0.42 and 0.51 kg N per 1,000 kg animal mass per day for breeding and market swine, respectively (0.5 for swine in aggregate assuming a 90/10 per cent split of finishing and breeding swine), in Western Europe, which is the region used by Czechia for other livestock types. During the review Czechia explained that the value 0.68 kg N per 1,000 kg animal mass per day is the aggregate swine Nex rate taken from table 10.19 in an older hard-copy version of the 2006 IPCC Guidelines, and that this number has since been revised in more recent versions. Czechia also noted that the up-to-date default value of 0.5 in the 2006 IPCC Guidelines is close to the Nex rate implied by the Nex and TAM data from implementing decree 377/2013 Coll. (0.48 kg N per 1,000 kg animal mass per day in 2020). The ERT understands that correct reporting should use default parameters from the most recently revised version of the 2006 IPCC Guidelines. Using the default value of 0.5 kg N per 1,000 kg animal mass per day for 1990–2018 would lead to a 26 per cent decrease in direct N_2O emissions from swine manure management across the time series (–0.03 kt N_2O or –8.7 kt CO_2 eq in 2018), as well as decreases in indirect N_2O emissions from manure management and direct and indirect emissions from application of swine manure to soils. The ERT recommends that Czechia either (a) apply the default Nex rate of 0.5 kg N per 1,000 kg animal mass per day for swine from the most recent update of the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10.19) for 1990–2018 or (b) revise the method for estimating Nex from swine for 1990–2018 to align better with the values for 2019 and 2020, as noted in issue ID# A.14 above concerning time-series consistency of Nex estimates.	Yes. Accuracy
A.16	3.D.b.2 N leaching and run-off – N_2O	The Party reported in CRF table 3.D (cell C21), for all inventory years, a quantity of N lost through leaching and run-off which, when combined with reported indirect N_2O emissions from leaching and run-off, leads to an IEF of 0.00225 kg N_2O-N/kg N. This IEF is the lowest of all reporting Parties (the range being 0.002–4772.73 kg N_2O-N/kg N) and half the value of the second lowest (0.005 kg N_2O-N/kg N). During the review, Czechia confirmed that there is no error in the calculation of emissions from this category but there was an error in copying the value of quantity of N lost through leaching and run-off into CRF table 3.D that will be corrected in the next submission. The ERT notes that the value the Party entered in cell C21 actually equates to the total amount of N applied to soils, and can confirm that the IEF produced from entering the correct value in that cell (using $Frac_{LEACH-(H)}$ of 0.3 as indicated in cell C34 of CRF table 3.D) is 0.0075. This is the	Yes. Convention reporting adherence

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
		expected value from use of the default EF_5 from the 2006 IPCC Guidelines (vol. 4, chap. 11, table 11.3) as indicated in NIR table 5-49 (p.262). The ERT recommends that Czechia correct the error in reporting of N lost through leaching and run-off in CRF table 3.D (cell C21).	
A.17	3.G Liming – CO_2	The Party reported in its NIR (section 5.7.2, p.268) that country-specific data on the share of dolomite and limestone in total lime applied are used for 2018–2020, whereas expert judgment following an ERT recommendation from the in-country review in 2017 is used for 1990–2017. The information was confirmed during the review. The ERT notes that the impact of the share of limestone and dolomite on emissions is relatively small, as the EFs of limestone and dolomite are similar (0.12 and 0.13 t CO_2C/t respectively). Applying the average shares of limestone and dolomite for 2018–2020 calculated from NIR table 5-54 (p.268) (45 per cent limestone and 55 per cent dolomite) to the total lime applied in 2017 would lead to 5.4 kt (3.4 per cent) higher CO_2 emissions than applying the 90/10 split to that year, which is below the significance threshold for Czechia (56.67 kt CO_2 eq). The ERT nonetheless notes that it is good practice to ensure time-series consistency of AD assumptions. The ERT recommends that Czechia review the assumptions on the share of limestone and dolomite in total lime applied for 1990–2017 in the light of the data for 2018–2020 and attempt to ensure time-series consistency of this parameter. In the absence of the same high-quality data for the earlier time series as those used for 2018–2020, this could include seeking additional expert judgment on trends over time in limestone and dolomite use, or use of other proxy data.	Yes. Consistency
LULUCF			
L.10	4.A.1 Forest land remaining forest land – CO_2	As reported in its NIR (section 6.4.2.2, p.291), the Party newly estimated CSC in the litter pool, implementing a tier 3 estimation approach, which caused significant changes in CSC in forest land remaining forest land, in particular for recent years when compared with the CSC of the 2021 submission. The Party included in its NIR (annex A3.6.3, p.522) a verification analysis for the living biomass pool between the 2021 and current submissions to ensure consistency with a tier 2 estimate. However, the ERT did not find any verification analysis for the other pools. The ERT noted that the recent significant increase in the litter carbon pool was caused by the high sanitation harvest owing to unprecedented drought since 2015 and a bark-beetle outbreak. The ERT found, however, that the 2020 implied CSC factor for litter (0.41 t-C/ha) was the highest of that of all reporting Parties (–0.11–0.36 t-C/ha). The ERT also noted that the simple ratio of CSC in the litter pool to CSC loss in living biomass was quite high (8.6 per cent for 2019 and 8.3 per cent for 2020). The ERT considers that the values of CSC in the litter pool are too high compared with the amount of harvest. During the review, the Party explained that CSC in the litter pool is driven both by input related to harvest quantities and respiration loss of the entire litter stock that is caused by respiration and accumulation over several years, hence the dynamics in CSC are not comparable with harvest quantities. Czechia also explained that if only the normal years (not including recent exceptional years) are considered, there would be no significant relationship between CSC in the litter pool and harvest level since the respiration processes over accumulated litter stock would be decoupled from annual harvest volumes.	Yes. Accuracy

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
		The ERT recommends that the Party conduct a verification analysis for CSC in the litter and deadwood pools in line with paragraph 41 of the UNFCCC Annex I inventory reporting guidelines and clearly document in the NIR the results of the analysis.	
L.11	4.A.2 Land converted to forest land – CO_2	The Party showed in its NIR (figure 6-15, p.295) mean carbon stock values of the litter and deadwood pools for the reporting period, which are to be used as reference values to be reached after the transition period (i.e. 20 years for the litter pool and 100 years for the deadwood pool), which are provided by the Carbon Budget Model of the Canadian Forest Sector calculation. Czechia included the assumption that its turnover and transfer rates are consistent with those used for forest land remaining forest land and no management intervention or natural disturbances such as salvage logging are included when estimating CSC in the living biomass pool in the category of land converted to forest land. However, the ERT noted that the methodology for deriving the reference values of the litter and deadwood pools is not described, nor is the increasing trend of the values in the litter pool over the time series, with a higher increase in the recent three years in figure 6-15, explained in the NIR. During the review, the Party clarified that the increasing trends of mean carbon stock value in the litter pool over time are associated with the increase of mean growing stock in the country which occurred when amount of harvest is small in relation to increment. Czechia also explained that the recent increase in mean carbon stock in the litter pool was not affected by salvage logging, as the impact of salvage logging was excluded from land converted to forest land (category 4.A.2). The ERT recommends that the Party (a) clearly explain overall increasing trends of mean carbon stock value in the litter pool in figure 6-15 in its NIR across the time series and (b) provide a description of the methodology used for estimating the mean carbon stock (reference values), including an explanation of how the impact of management interventions is excluded from the calculation.	Yes. Transparency
Waste			
W.12	5. General (waste) – CO_2, CH_4 and N_2O	The NIR provides overall information on the waste sector (e.g. increased share of composting and aerobic digestion in recent years) (section 7.1, p.321), but there is no detailed presentation of the waste flows or the changes in waste generation and treatment across the time series. The ERT considers that the inclusion of such information would improve transparency within the sector (e.g. regarding the consistency of the sludge balance between the solid waste and wastewater treatment categories) and demonstrate accuracy, completeness and consistency with other sectors such as energy and agriculture. During the review, the ERT asked the Party to provide data on industrial waste treated in SWDS and information on how the sludge is treated and the types of waste treated in composting and anaerobic digestion plants, as that information had not been included in the NIR. During the review, the Party provided the information requested and stated that it will provide additional information on the different waste types and flows in the next submission. The ERT recommends that the Party improve the transparency of the NIR by including in the overview of the waste sector details (e.g. as a flow chart) on waste flows used in inventory estimates, including the amounts from all types of waste produced in the country (MSW, industrial, hazardous, clinical and sludge), taking into account imports and exports, and the treatment applied to different types of waste treated in the country, including recycling.	Yes. Transparency

ID#	*Finding classification*	*Description of finding with recommendation or encouragement*	*Is finding an issue/problem?*[a]
W.13	5.A.1 Managed waste disposal sites – CH_4	The Party reported in its NIR (section 7.2.1.1, pp.327–328) the information related to the CH_4 recovery from landfills. However, the ERT has noted that there is no information about data sources used to obtain this information across the time series. During the review, the Party clarified that the data source is the Ministry of Industry and Trade and shared with the ERT an official, public document containing the information on the CH_4 recovery ("Renewable energy in 2020"). During the review, Czechia stated that data sources and links where available will be added to the NIR in its next submission. The ERT recommends that the Party improve the transparency of the waste sector reporting by including all data sources used and, as far as possible, links to those data sources.	Yes. Transparency
W.14	5.B.2 Anaerobic digestion at biogas facilities – CH_4	The Party reported in its NIR (section 7.3.2, pp.331–332) the information regarding the data and methodology used to estimate the emissions from anaerobic digestion, which is based on the default percentage of leakages proposed in the 2006 IPCC Guidelines (vol. 5, chap. 4.1). The ERT noted that Czechia reported the AD as "NE" in CRF table 5.B (since the activity started in 2009) as the emissions are directly derived from the application of a percentage of leakage from the CH_4 produced, which is measured, and the Party has not included any information about the amount of waste treated at anaerobic digestion plants. During the review, the Party clarified that its anaerobic digestion plants are modern and produce reliable data on the biogas produced, but not on the amount of waste treated. However, Czechia noted that, for comparability of reporting, AD used in the calculations will be added to the CRF tables in future submissions. The ERT recommends that the Party improve the transparency of the NIR and ensure comparable information on AD and IEF in the CRF tables by including the amount of waste treated in anaerobic digestion plants (kt dry matter) in CRF table 5.B.	Yes. Transparency
W.15	5.D.1 Domestic wastewater – N_2O	The Party reported the degree of utilization of modern, centralized wastewater treatment plants (Tplan) in CRF table 5.D as "NE" for the entire time series. The ERT has noted, however, that direct N_2O emissions produced in advanced centralized wastewater treatment plants with controlled nitrification and denitrification steps have not been estimated or mentioned in the NIR. During the review, Czechia clarified that it has no detailed data or separate statistics for reporting the emissions in the CRF tables for this non-mandatory category. The ERT encourages the Party clarify in the NIR whether nitrification and denitrification steps exist at the country's advanced centralized wastewater treatment plants. If they do, the ERT encourages the Party to continue improving its inventory by estimating those emissions using the methodology suggested in the 2006 IPCC Guidelines (vol. 5, chap. 6, box 6.1). If they do not, the ERT encourages the Party to improve the transparency of the CRF tables by using the most appropriate notation key ("NO").	Not an issue/problem
KP-LULUCF		No findings for KP-LULUCF additional to those included in table 3 were made by the ERT during the review.	

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

VI. Application of adjustments

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

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

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

VIII. Questions of implementation

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

Annex I

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

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

Table I.1
Total greenhouse gas emissions and removals for Czechia, base year–2020
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions and removals including indirect CO_2 emissions*[a]		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)*[b]	*KP-LULUCF (Article 3.3 of the Kyoto Protocol)*[c]	*KP-LULUCF (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								-4 686.00
Base year[d]	188 119.02	197 055.24	190 011.78	198 947.99	NA		NA	
1990	188 019.02	196 955.24	189 911.77	198 847.99				
1995	146 283.29	156 320.85	147 738.40	157 775.95				
2000	140 206.27	149 594.37	141 399.99	150 788.09				
2010	132 510.35	139 549.87	133 493.58	140 533.11				
2011	130 759.03	138 116.49	131 723.06	139 080.52				
2012	126 699.27	134 176.04	127 620.82	135 097.60				
2013	122 080.75	128 913.03	122 902.85	129 735.13		–259.30	NA	–6 242.65
2014	119 978.69	126 728.25	120 804.39	127 553.95		–295.09	NA	–6 073.49
2015	121 480.17	128 158.54	122 277.33	128 955.70		–370.75	NA	–5 846.04
2016	123 701.94	129 495.19	124 461.24	130 254.50		–364.81	NA	–4 970.40
2017	126 437.61	130 553.18	127 156.68	131 272.25		–381.90	NA	–3 299.29
2018	130 140.94	128 733.42	130 834.83	129 427.31		–465.83	NA	2 402.17
2019	131 130.62	122 895.33	131 786.88	123 551.59		–497.36	NA	9 280.95
2020	125 560.38	112 788.58	126 110.35	113 338.55		–464.15	NA	13 826.02

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

[a] The Party reported indirect CO2 emissions in CRF table 6.

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

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

[d] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO2, CH4 and N2O, and 1995 for HFCs, PFCs, SF6 and NF3. Czechia has not elected any activities under Article 3, para. 4, of the Kyoto Protocol. For activities under Article 3, para. 3, of the Kyoto Protocol and FM under Article 3, para. 4, only the inventory years of the commitment period must be reported.

Table I.2
Greenhouse gas emissions and removals by gas for Czechia, excluding land use, land-use change and forestry, 1990–2020
(kt CO_2 eq)

	CO_2[a]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	166 103.50	23 372.30	9 287.95	NO	NO	NE, NO	84.24	NO
1995	133 082.25	17 926.27	6 583.19	95.55	0.01	NE, NO	88.68	NO
2000	128 349.68	15 053.57	6 404.25	867.51	4.69	NE, NO	108.40	NO
2010	118 465.38	13 980.46	5 347.92	2 608.38	48.06	NE, NO	82.76	0.15
2011	116 149.87	14 009.62	5 989.66	2 833.83	8.31	NE, NO	88.64	0.59
2012	112 202.23	13 999.84	5 851.44	2 944.46	6.31	NE, NO	92.44	0.89
2013	107 533.49	13 401.22	5 627.63	3 084.11	4.22	NE, NO	83.04	1.41
2014	105 054.55	13 398.36	5 739.33	3 276.27	3.17	NE, NO	79.90	2.37
2015	105 792.81	13 398.78	6 136.66	3 544.88	2.15	NE, NO	78.27	2.15
2016	107 415.02	12 688.07	6 284.87	3 783.94	1.82	NE, NO	78.63	2.15
2017	108 466.82	12 493.81	6 214.87	4 017.36	2.03	NE, NO	74.03	3.33
2018	107 031.86	12 380.54	5 862.23	4 076.88	2.13	NE, NO	70.56	3.11
2019	101 669.22	12 091.43	5 606.61	4 112.18	1.62	NE, NO	68.00	2.52
2020	92 403.85	11 518.66	5 328.32	4 019.39	1.02	NE, NO	65.16	2.15
Percentage change 1990–2020	**–44.4**	**–50.7**	**–42.6**	**NA**	**NA**	**NA**	**–22.7**	**NA**

Note: Emissions and removals reported in the sector other (sector 6) are not included in this table.
[a] Including indirect CO_2 emissions as reported in CRF table 6.

Table I.3
Greenhouse gas emissions and removals by sector for Czechia, 1990–2020
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	162 488.65	17 712.71	15 512.64	–8 936.22	3 133.99	NO
1995	130 407.36	14 614.73	9 317.00	–10 037.56	3 436.86	NO
2000	122 942.96	15 653.36	8 488.30	–9 388.10	3 703.47	NO
2010	113 134.90	15 363.63	7 471.85	–7 039.53	4 562.73	NO

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
2011	110 654.63	15 698.69	8 127.02	–7 357.46	4 600.19	NO
2012	106 851.94	15 449.99	8 043.62	–7 476.77	4 752.04	NO
2013	101 380.32	15 333.90	8 013.04	–6 832.28	5 007.87	NO
2014	98 342.90	16 124.66	8 082.65	–6 749.56	5 003.73	NO
2015	99 339.17	15 864.48	8 667.76	–6 678.37	5 084.28	NO
2016	100 557.88	15 973.04	8 604.87	–5 793.26	5 118.70	NO
2017	101 331.68	16 227.16	8 562.43	–4 115.57	5 150.98	NO
2018	99 119.13	16 787.10	8 322.36	1 407.52	5 198.72	NO
2019	94 153.41	16 092.89	8 069.72	8 235.29	5 235.57	NO
2020	84 840.77	15 419.29	7 841.83	12 771.80	5 236.65	NO
Percentage change 1990–2020	**–47.8**	**–12.9**	**–49.4**	**–242.9**	**67.1**	**NA**

Notes: (1) Czechia did not report emissions or removals in the sector other (sector 6); (2) totals include indirect CO_2 emissions reported in CRF table 6.

Table I.4

Greenhouse gas emissions and removals from activities under Article 3, paragraphs 3–4, of the Kyoto Protocol by activity, base year–2020, for Czechia

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[a]	*Activities under Article 3.3 of the Kyoto Protocol*		*FM and elected activities under Article 3.4 of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–4 686.00				
Technical correction				–225.00				
Base year	NA				NA	NA	NA	NA
2013		–517.08	257.78	–6 242.65	NA	NA	NA	NA
2014		–551.26	256.17	–6 073.49	NA	NA	NA	NA
2015		–585.98	215.23	–5 846.04	NA	NA	NA	NA
2016		–608.93	244.11	–4 970.40	NA	NA	NA	NA
2017		–641.38	259.48	–3 299.29	NA	NA	NA	NA
2018		–664.03	198.20	2 402.17	NA	NA	NA	NA
2019		–699.23	201.88	9 280.95	NA	NA	NA	NA
2020		–712.00	247.85	13 826.02	NA	NA	NA	NA
Percentage change base year–2020					**NA**	**NA**	**NA**	**NA**

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

[a] The value reported in this column relates to 1990.

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

Table I.5
Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol for Czechia
(kt CO_2 eq)

GHG source/sink activity	*Net emissions/removals*										*Accounting parameters*	*Accounting quantity*[a]
	Base year[b]	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*Total*[c]		
A.1. AR		–517.080	–551.262	–585.981	–608.927	–641.377	–664.029	–699.234	–712.001	–4 979.890		–4 979.889
Excluded emissions from natural disturbances[d]		NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
Excluded subsequent removals from land subject to natural disturbances		NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
A.2. Deforestation		257.780	256.170	215.229	244.112	259.478	198.200	201.877	247.851	1 880.698		1 880.698
B.1. FM										–922.720		38 365.280
Net emissions/ removals		–6 242.651	–6 073.488	–5 846.039	–4 970.405	–3 299.287	2 402.173	9 280.955	13 826.022	–922.720		
Excluded emissions from natural disturbances[d]		NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
Excluded subsequent removals from land subject to natural disturbances		NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
Any debits from newly established forest		NA	NA	NA	NA	NA	NA	NA	NA	NA		NA

GHG source/sink activity	*Net emissions/removals*											
	Base year[b]	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*Total*[c]	*Accounting parameters*	*Accounting quantity*[a]
FMRL[e]											–4 686.000	
Technical corrections to FMRL											–225.000	
FM cap											55 528.593	38 365.280
B.2. CM (if elected)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
B.3. GM (if elected)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
B.4. RV (if elected)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
B.5. WDR (if elected)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA

[a] Cumulative net emissions and removals for all years of the commitment period reported in the annual submission under review.
[b] Net emissions and removals from CM, GM, RV and/or WDR, if elected, in the Party's base year as established in decision 9/CP.2.
[c] The accounting quantity is the total quantity of units to be issued or cancelled for a particular activity.
[d] The Party indicated that it does not intend to exclude emissions from natural disturbances.
[e] As inscribed in the appendix to the annex to decision 2/CMP.7 in kt CO_2 eq per year.

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

Table I.6
Key data for Czechia under Article 3, paragraphs 3–4, of the Kyoto Protocol from its 2022 annual submission

Parameter	*Data values*
Periodicity of accounting	(a) AR: commitment period accounting (b) Deforestation: commitment period accounting (c) FM: commitment period accounting (d) CM: not elected (e) GM: not elected (f) RV: not elected (g) WDR: not elected
Elected activities under Article 3, paragraph 4, of the Kyoto Protocol	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	6 941.074 kt CO_2 eq (55 528.593 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, CERs and ERUs and/or issuance of RMUs in the national registry for:	
1. AR	Issue 4 979 889 RMUs
2. Deforestation	Cancel 1 880 698 units
3. FM	Cancel 38 365 280 units

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

Annex II

Information to be included in the compilation and accounting database

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

Table II.1
Information to be included in the compilation and accounting database for 2020, including on the commitment period reserve, for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
CPR	**468 463 683**	–	–	**468 463 683**
Annex A emissions				
CO_2	92 403 848	–	–	92 403 848
CH_4	11 518 664	–	–	11 518 664
N_2O	5 328 319	–	–	5 328 319
HFCs	4 019 390	–	–	4 019 390
PFCs	1 015	–	–	1 015
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	65 157	–	–	65 157
NF_3	2 154	–	–	2 154
Total Annex A sources[a]	113 338 547	–	–	113 338 547
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–712 001	–	–	–712 001
Deforestation	247 851	–	–	247 851
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	13 826 022	–	–	13 826 022

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

Table II.2
Information to be included in the compilation and accounting database for 2019 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	101 669 225	–	–	101 669 225
CH_4	12 091 433	–	–	12 091 433
N_2O	5 606 609	–	–	5 606 609
HFCs	4 112 183	–	–	4 112 183
PFCs	1 620	–	–	1 620
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	68 002	–	–	68 002
NF_3	2 523	–	–	2 523
Total Annex A sources[a]	123 551 595	–	–	123 551 595
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–699 234	–	–	–699 234
Deforestation	201 877	–	–	201 877
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				

	Original submission	*Revised submission*	*Adjustment*	*Final value*
FM	9 280 955	–	–	9 280 955

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

Table II.3
Information to be included in the compilation and accounting database for 2018 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	107 031 857	–	–	107 031 857
CH_4	12 380 539	–	–	12 380 539
N_2O	5 862 234	–	–	5 862 234
HFCs	4 076 879	–	–	4 076 879
PFCs	2 130	–	–	2 130
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	70 557	–	–	70 557
NF_3	3 111	–	–	3 111
Total Annex A sources[a]	129 427 309	–	–	129 427 309
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–664 029	–	–	–664 029
Deforestation	198 200	–	–	198 200
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	2 402 173	–	–	2 402 173

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

Table II.4
Information to be included in the compilation and accounting database for 2017 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	108 466 818	–	–	108 466 818
CH_4	12 493 814	–	–	12 493 814
N_2O	6 214 870	–	–	6 214 870
HFCs	4 017 360	–	–	4 017 360
PFCs	2 033	–	–	2 033
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	74 025	–	–	74 025
NF_3	3 333	–	–	3 333
Total Annex A sources[a]	131 272 254	–	–	131 272 254
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–641 377	–	–	–641 377
Deforestation	259 478	–	–	259 478
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	–3 299 287	–	–	–3 299 287

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

Table II.5
Information to be included in the compilation and accounting database for 2016 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				

	Original submission	*Revised submission*	*Adjustment*	*Final value*
CO_2	107 415 022	–	–	107 415 022
CH_4	12 688 065	–	–	12 688 065
N_2O	6 284 871	–	–	6 284 871
HFCs	3 783 940	–	–	3 783 940
PFCs	1 818	–	–	1 818
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	78 629	–	–	78 629
NF_3	2 150	–	–	2 150
Total Annex A sources[a]	130 254 496	–	–	130 254 496
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–608 927	–	–	–608 927
Deforestation	244 112	–	–	244 112
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	–4 970 405	–	–	–4 970 405

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

Table II.6
Information to be included in the compilation and accounting database for 2015 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	105 792 814	–	–	105 792 814
CH_4	13 398 778	–	–	13 398 778
N_2O	6 136 658	–	–	6 136 658
HFCs	3 544 881	–	–	3 544 881
PFCs	2 152	–	–	2 152
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	78 267	–	–	78 267
NF_3	2 150	–	–	2 150
Total Annex A sources[a]	128 955 701	–	–	128 955 701
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–585 981	–	–	–585 981
Deforestation	215 229	–	–	215 229
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	–5 846 039	–	–	–5 846 039

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

Table II.7
Information to be included in the compilation and accounting database for 2014 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	105 054 545	–	–	105 054 545
CH_4	13 398 364	–	–	13 398 364
N_2O	5 739 325	–	–	5 739 325
HFCs	3 276 270	–	–	3 276 270
PFCs	3 168	–	–	3 168
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	79 904	–	–	79 904
NF_3	2 373	–	–	2 373

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Total Annex A sources[a]	127 553 949	–	–	127 553 949
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–551 262	–	–	–551 262
Deforestation	256 170	–	–	256 170
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	–6 073 488	–	–	–6 073 488

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

Table II.8
Information to be included in the compilation and accounting database for 2013 for Czechia
(t CO_2 eq)

	Original submission	*Revised submission*	*Adjustment*	*Final value*
Annex A emissions				
CO_2	107 533 495	–	–	107 533 495
CH_4	13 401 216	–	–	13 401 216
N_2O	5 627 633	–	–	5 627 633
HFCs	3 084 113	–	–	3 084 113
PFCs	4 222	–	–	4 222
Unspecified mix of HFCs and PFCs	NO, NE	–	–	NO, NE
SF_6	83 041	–	–	83 041
NF_3	1 409	–	–	1 409
Total Annex A sources[a]	129 735 128	–	–	129 735 128 –
Activities under Article 3, paragraph 3, of the Kyoto Protocol				
AR	–517 080	–	–	–517 080
Deforestation	257 780	–	–	257 780
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol				
FM	–6 242 651	–	–	–6 242 651

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

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

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

(a) 2.A.4.d other process use of carbonates – other – mineral wood production (CO_2) (1990–1999) (see ID# I.4 in table 3);

(b) 5.B biological treatment of solid waste (CH_4 and N_2O) (1990–2004) (see ID#s W.6 and W.7 in table 3).

Annex IV

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 1996. *Revised 1996 IPPC Guidelines for National Greenhouse Gas Inventories.* JT Houghton, LG Meira Filho, et al. (eds.). IPCC. Geneva. Available at https://www.ipcc.ch/report/revised-1996-ipcc-guidelines-for-national-greenhouse-gas-inventories/.

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

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

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

IPCC. 2019. *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*. E Calvo Buendia, K Tanabe, A Kranjc, et al. (eds.). Geneva: IPCC. Available at https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html.

B. UNFCCC documents

Annual review reports

Reports on the individual reviews of the 2012, 2013, 2014, 2015, 2016, 2017, 2019 and 2021 annual submissions of Czechia, contained in documents FCCC/ARR/2012/CZE, FCCC/ARR/2013/CZE, FCCC/ARR/2014/CZE, FCCC/ARR/2015/CZE, FCCC/ARR/2016/CZE, FCCC/ARR/2017/CZE, FCCC/ARR/2019/CZE and FCCC/ARR/2021/CZE respectively.

Other

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

Annual status report for Slovenia for 2022. Available at https://unfccc.int/sites/default/files/resource/asr2022_SVN.pdf.

Conclusions and recommendations from the 16th meeting of greenhouse gas inventory lead reviewers, 2019. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/review-process

Conclusions and recommendations from the 19th meeting of greenhouse gas inventory lead reviewers, 2022. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/review-process

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Czechia (FCCC/IRR/2016/CZE). Available at https://unfccc.int/documents/28366.

Report of the technical assessment of the forest management reference level submission of Czech Republic submitted in 2011 (FCCC/TAR/2011/CZE). Available at https://unfccc.int/documents/6823.

C. Other documents used during the review

Responses to questions during the review were received from Markéta Klusackova and Risto Saarikivi (Czech Hydrometeorological Institute), including additional material on the methodology and assumptions used. The following references may not conform to UNFCCC editorial style as some have been reproduced as received:

Czech Nomenclature for Reporting Tables submitted in accordance with the Convention on Long-range Transboundary Air Pollution, 2022 submission. Available at: https://webdab01.umweltbundesamt.at/download/submissions2022/CZ_NFR2022.zip?cgiproxy_skip=1.

Obnovitelné zdroje energie v roce 2020 (Renewable energy in year 2020). Available at: https://www.mpo.cz/assets/cz/energetika/statistika/obnovitelne-zdroje-energie/2021/9/Obnovitelne-zdroje-energie-2020.pdf.