United Nations

FCCC/ARR/2023/BLR

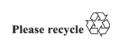Framework Convention on
Climate Change

Distr.: General
25 March 2024

English only

Report on the individual review of the inventory submission of Belarus submitted in 2023*

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). This report presents the results of the individual review of the 2023 inventory submission of Belarus, conducted by an expert review team in accordance with 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". The review took place from 18 to 22 September 2023 in Bonn.

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* In the symbol for this document, 2023 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
2019 Refinement to the 2006 IPCC Guidelines	*2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
Annex I Party	Party included in Annex I to the Convention
B_{AFTER}	biomass carbon stock on land immediately after conversion
Belstat	National Statistical Committee of Belarus
BKB	brown coal briquette
C	carbon
C_4F_6	hexafluorobutadiene
C_4F_8O	octafluorotetrahydrofuran
C_5F_8	octafluorocyclopentene
CH_4	methane
CO	carbon monoxide
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"
CRF	common reporting format
EF	emission factor
ERT	expert review team
FAO	Food and Agriculture Organization of the United Nations
F-gas	fluorinated gas
$F_{IND-COM}$	fraction of industrial and commercial co-discharged protein into the sewer system
$F_{NON-CON}$	fraction of non-consumed protein added to wastewater
FOD	first-order decay
$Frac_{GASF}$	fraction of synthetic nitrogen fertilizer applied to soils that volatilizes as nitrogen oxides and ammonia
$Frac_{GASM}$	fraction of applied organic nitrogen fertilizer materials and of urine and dung nitrogen deposited by grazing animals that volatilizes as ammonia and nitrogen oxides
$Frac_{LOSS}$	fraction of total nitrogen loss from managed manure
F_{SOM}	fraction of nitrogen mineralized from loss of soil organic carbon in mineral soils through land-use change or management practices
GE	gross energy intake
GHG	greenhouse gas
GWP	global warming potential
GWP-100	100-year time-horizon global warming potential values
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*

IPPU	industrial processes and product use
JSC	joint stock company
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MCF	methane correction factor (waste)
MMS	manure management system(s)
MSW	municipal solid waste
N	Nitrogen
N_2O	nitrous oxide
NA	not applicable
NCV	net calorific value
NE	not estimated
NEU	non-energy use
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NH_3	Ammonia
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
NO_X	nitrogen oxides
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SWDS	solid waste disposal site(s)
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"
VS	volatile solid(s)
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 2023 inventory submission of Belarus, organized by the secretariat in accordance with the UNFCCC review guidelines, particularly 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 18 to 22 September 2023 in Bonn and was coordinated by Javier Hanna Figueroa, Lisa Hanle and Anil Raut (secretariat). Table 1 provides information on the composition of the ERT that conducted the review for Belarus.

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

Area of expertise	Name (Party)
Generalists	Sorin Deaconu (Romania), Veronica Eklund (Sweden) and Marina Vitullo (Italy)
Energy	Maria Sol Aliano (Argentina), Laura Aranguren (Colombia), Christian Boettcher (Germany), Dawa Chhoedron (Bhutan), Valentina Coccetti (Australia), Ulrich Elsenberger (Germany), Brandon Greenlaw (Canada), Benise Nissa Joseph (Saint Lucia), Alastair Lane (Australia), Lawrence Mashungu (Zimbabwe), Malik Mechhoud (Algeria), Gherghita Nicodim (Romania), Angie Lorena Sanchez Pina (United Arab Emirates), Mamahloko Senatla Jaane (South Africa), Stanislav Stokov (Estonia), Shawn Tobin (Canada), Jongikhaya Witi (South Africa) and Shevon Wood (Guyana)
IPPU	Oumar Bakayoko (Côte d'Ivoire), Kathrine Loe Bjønness (Norway), Tommi Valtteri Forsberg (Finland), Eriko Hirata (Japan), Valentina Idrissova (Canada), Mauro Meirelles de Oliveira Santos (Brazil), Jacek Skoskiewicz (Poland), Mark Straton (Australia) and Caroline Tagwireyi (Zimbabwe)
Agriculture	Kent Buchanan (South Africa), Sorin Deaconu (Romania), Arthur Ha (Australia), Chang Liang (Canada), Andres Said (Argentina), John Steller (United States) and Dan Zwartz (Australia)
LULUCF	Kwame Agyei (Ghana), Rosie Brook (United Kingdom), Markus Didion (Switzerland), Oliver Fitzpatrick (Australia), Sini Maaria Niinistö (Finland), Beatriz Sánchez Jiménez (Spain) and Amanda Thomson (United Kingdom)
Waste	Elena Oana Badele (Romania), Juliana Boateng Bempah (Ghana), Daniela Carolina Da Costa Duarte (Sao Tome and Principe), Ryan Deosaran (Trinidad and Tobago), Sandra Boitumelo Motshwanedi (South Africa), Alex Murray (Australia), Takefumi Oda (Japan) and Igor Ristovski (North Macedonia)
Lead reviewers	Marina Vitullo and Jongikhaya Witi

2.   The basis of the findings in this report is the assessment by the ERT of the Party's 2023 inventory submission in accordance with the UNFCCC review guidelines.

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

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

5.   Annex I presents the annual GHG emissions of Belarus, including totals excluding and including LULUCF, indirect CO_2 emissions, and emissions by gas and by sector.

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[1] Issues are defined in decision 13/CP.20, annex, para. 81.

II. Summary and general assessment of the Party's 2023 inventory submission

6. Table 2 provides the assessment by the ERT of the Party's 2023 inventory 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 2023 inventory submission of Belarus

Assessment			Issue ID#(s) in table 3 or 5[a]
Date of submission	Original submission: NIR, 14 April 2023; CRF tables (version 3), 14 April 2023		
Review format	Centralized		
Source of GWP-100	IPCC Fourth Assessment Report		
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?	No	
	(b) Selection and use of methodologies and assumptions?	Yes	E.9, E.17, E.30, E.58, I.18, A.16, L.19, W.16
	(c) Development and selection of EFs?	Yes	E.2, E.23, E.59, W.18, W.23
	(d) Collection and selection of AD?	Yes	E.18, E.19, E.38, E.40, E.56, I.15, A.2, L.6, L.13, W.2, W.3, W.7, W.8, W.17, W.21
	(e) Reporting of recalculations?	Yes	G.9, E.52
	(f) Reporting of a consistent time series?	Yes	W.5
	(g) Reporting of uncertainties, including methodologies?	Yes	G.11, G.12, L.2, L.7
	(h) QA/QC?	Yes	E.3, E.12, E.50
	(i) Missing categories, or completeness?[b]	Yes	E.33, I.9, I.11, I.13, I.14, I.16, I.21, I.22, A.12, A.17, L.1, L.8, L.18
	(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?	Yes	
National inventory arrangements	Have any issues been identified with the effectiveness and reliability of the institutional, procedural and legal arrangements for estimating GHG emissions?	No	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	G.10
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	

[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 II.

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

7. Table 3 compiles the recommendations from previous review reports that were included in the most recent previous review report, published on 2 March 2022,[2] and had not been resolved by the time of publication of the report on the review of the Party's 2021 inventory submission. The ERT has specified whether it believes the Party had resolved, was addressing or had not resolved each issue 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 Belarus

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
General			
G.1	Further improvements (identified by the Party) (G.3, 2021) (G.26, 2019) Transparency	Report in the NIR on the status of implementation of each planned improvement and on the time frames for implementation.	Addressing. The Party reported in its NIR information on planned improvements for the IPPU (chap. 4, sections 4.2.1.6 (p.85), 4.2.1.6 (p.86), 4.4.7.6 (p.116), 4.5.5.6 (p.119), 4.6.1.6 (p.129) and 4.7.1.6 (p.148)), agriculture (chap. 5, sections 5.2.6 (p.174), 5.3.6 (p.188) and 5.4.6 (p.196)), LULUCF (chap. 6, sections 6.4.6 (p.245), 6.5.6 (p.250), 6.6.6 (p.252), 6.7.6 (p.254), 6.8.6 (p.258), 6.9.6 (p.259) and 6.10.6 (p.267)) and waste (chap. 7, sections 7.2.6 (p.275), 7.4.6 (p.278) and 7.5.2.6 (p.287)) sectors. For many of these planned improvements the Party provided information on the time frames for implementation. No information was included in the NIR on any planned improvements or on the status of implementation of previous planned improvements for the energy sector, and no information was provided on the status of implementation of previous planned improvements for other sectors. During the review, the Party explained that it is not possible to determine a time frame for improvements for all categories as it is a time- and effort-consuming process. The ERT considers that the recommendation has not yet been fully addressed since the Party did not provide information in the NIR on planned improvements for the energy sector and status of implementation of previous planned improvements, or status of implementation of previous planned improvements or a time frame for implementation of the planned improvements for all categories in the other sectors.
G.2	Methods (G.8, 2021) (G.9, 2019) (G.6, 2017) (G.6, 2016) (G.6, 2015) (table 3, 2013) (23, 2012) Transparency	Include in the NIR more information to explain the methodologies and procedures used in the calculations, a description of the data-collection process and more data tables to present the AD and EFs that have been used, as well as background information on all AD used in the	Addressing. The Party has made significant progress in terms of improving the overall transparency of the inventory. The NIR contains more information on methodologies and data tables for the AD and EFs used. Among others, the following data tables on the EFs used to calculate GHG emissions for the energy sector were included in the NIR: tables 3.9 (pp.49–50), 3.12 (p.53), 3.17 (pp.58–59), 3.20 (p.63), 3.21 (p.63), 3.22 (p.64) and 3.25 (pp.67–68). The Party also extensively documented the data-collection process, for example for farm animals in the agriculture sector (category 3.A.1 cattle), and the method used to estimate CO_2 emissions from cement production (category 2.A.1). During the review, the Party confirmed that it

[2] FCCC/ARR/2021/BLR. The ERT notes that the report on the review of Belarus's 2022 inventory submission has not been published yet owing to insufficient funding for the review process. As a result, the latest previously published annual review report reflects the findings of the review of the Party's 2021 inventory submission.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
		inventory, specifically for the energy and industrial processes sectors.	included more background information in the NIR on methodologies, including data tables for the AD and EFs used. However, the ERT considers that the recommendation has not yet been fully addressed since the Party did not report complete and transparent information on the following:
			(a)　The method or assumptions used for allocating jet kerosene between international and domestic aviation for subcategory 1.A.3.a domestic aviation (see ID# E.20 below);
			(b)　The method and references used for the EFs applied to estimate emissions for subcategory 1.A.5.a stationary (see ID# E.46 below);
			(c)　Whether the amount of fuel reported in the energy balance under "distribution losses" is combusted or released as fugitive emissions (see ID# E.47 below);
			(d)　Data sources for the amount of MSW generated and the composition of MSW, or the methods used to estimate the AD for years when statistical data are missing, for example by clarifying why interpolation was applied for certain years while a constant value was applied for others for category 5.A solid waste disposal (see ID# W.4 below).
G.3	Methods (G.25, 2021) Transparency	Include in the inventory submission an explanation for categories that are considered to be key categories and for which national circumstances prohibit the use of a recommended method, and the reason(s) for the Party's inability to implement a recommended method in accordance with the decision trees in the 2006 IPCC Guidelines.	Not resolved. The Party used the recommended methods in accordance with the decision trees provided in the 2006 IPCC Guidelines for several key categories. Belarus reported in its NIR (pp.48–49) that it used a tier 1 method to estimate CO_2 emissions for solid fuels and peat and for some liquid fuels under category 1.A.1 energy industries, which is a key category, but did not explain which national circumstances prevent it from using a higher-tier method to estimate these emissions and the reason for its inability to implement a recommended method. The same applies to the Party's reporting of the following key categories: (1) CO_2 emissions for categories 1.A.2. manufacturing industries and construction (solid fuels and some liquid fuels),1.A.4. other sectors (solid fuels and some liquid fuels), 1.A.5 other (some liquid fuels), 2.A.2 lime production, 3.G liming, 3.H urea application, 4.A.1 forest land remaining forest land, 4.B.1 cropland remaining cropland, 4.E settlements and 4.G HWP; (2) CH_4 emissions for categories and subcategories 1.B.2.a oil and 1.B.2.b natural gas, 5.A solid waste disposal and 5.D wastewater treatment and discharge; and (3) N_2O emissions for category 3.D direct and indirect N_2O emissions from agricultural soils. During the review, the Party indicated that some explanations for not implementing higher-tier methods were included in the NIR and clarified, for example, that it used a tier 2 method for all key categories in the IPPU sector as well as for CH_4 emissions for categories 3.A enteric fermentation and 3.B manure management. The ERT considers that the recommendation has not yet been addressed since the Party did not use a recommended method for all key categories in accordance with the decision trees provided in the 2006 IPCC Guidelines, nor did it explain the national circumstances preventing it from using a recommended method and the reasons for its inability to implement a recommended method.
G.4	Notation keys (G.10, 2021) (G.13, 2019) (G.25, 2017)	Ensure the correct use of the notation keys (including "NA") in the CRF	Addressing. The Party has improved the use of notation keys in the CRF tables but still used them in an incorrect and inconsistent way across the time series for some categories in the energy sector (see ID# E.3 below) and in the following cases:

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
	Convention reporting adherence	tables in line with decision 24/CP.19, annex I, paragraphs 37, 50(f) and 53.	(a) The AD and CO_2, CH_4 and N_2O emissions from solid fuels for subcategory 1.A.2.c chemicals were reported as "NA" for 1996, 2000, 2006–2011 and 2016–2021. The ERT noted that as there is no consumption of solid fuels for these years, the appropriate notation key to use would be "NO";
			(b) The AD and CO_2, CH_4 and N_2O emissions from solid fuels and peat for subcategory 1.A.2.d pulp, paper and print were reported as "IE" or "NA" for most years of the time series. The Party did not clarify the extensive reporting of "NA" for both peat and solid fuels. During the review, the Party clarified that there was no consumption of peat in 2012–2021 and no consumption of solid fuels in 2016–2021. For 2012–2015, fuel consumption and emissions from solid fuels were included under subcategory 1.A.2.g.iv wood and wood products. The ERT emphasizes that if there is no consumption of solid fuels or peat, the correct notation key to use would be "NO";
			(c) The AD and CO_2, CH_4 and N_2O emissions from solid fuels (for 1990–2009, 2011 and 2016–2021), liquid fuels (for 1990–2008) and biofuels (for 1990–2010) were reported as "NA" for subcategory 1.A.2.g.iii mining (excluding fuels) and quarrying. During the review, the Party clarified that there was no consumption of solid fuels for this subcategory for 1990–2009, 2011 and 2016–2021. The ERT emphasizes that if there is no consumption of fuels, the correct notation key to use would be "NO";
			(d) The AD and CO_2, CH_4 and N_2O emissions from solid fuels were reported as "NA" for subcategory 1.A.2.g.vi textile and leather for 2002, 2004–2008, 2016 and 2018. During the review, the Party clarified that there was no consumption of solid fuels for this subcategory for 1990–1992, 1994, 2000, 2004–2008 and 2016–2021. The ERT emphasizes that if there is no consumption of fuels, the correct notation key to use would be "NO".
			During the review, the Party indicated that the use of notation keys reported in the CRF tables was in line with paragraphs 37, 50(f) and 53 of the UNFCCC Annex I inventory reporting guidelines. The ERT considers that the recommendation has not yet been fully addressed because the Party did not fully ensure the correct use of notation keys in the CRF tables for all categories and subcategories.
G.5	Notation keys (G.11, 2021) (G.14, 2019) (G.25, 2017) Convention reporting adherence	Provide justification for the use of notation keys, particularly "NE" and "IE", in the NIR and in CRF table 9.	Addressing. The Party provided explanations for using the notation keys "NE" and "IE" in the NIR and in CRF table 9 for several categories. However, there is still a lack of justification in the NIR and in the CRF tables for using notation keys for some categories. For example:
			(a) In the IPPU sector, the use of "NE" to report F-gases under categories 2.F.4 aerosols, 2.G other product manufacture and use and 2.H other was not explained in CRF table 9;
			(b) In the LULUCF sector, the use of "NE" to report carbon stock changes in categories 4.C grassland, 4.D wetlands and 4.F other land and N_2O emissions under subcategory 4(I).E.1.1 inorganic N fertilizers was not explained in CRF table 9;
			(c) In the LULUCF sector, the use of "IE" to report carbon stock changes in categories and subcategories 4.D.2.1 land converted to peat extraction, 4.D.2.2 land converted to flooded land, 4.E settlements, 4.F other land (organic soils) and 4.G HWP (approach B – HWP produced and

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
			exported –other) and N_2O emissions under category 4(IV) indirect N_2O emissions from managed soils was not explained in CRF table 9;
			(d) In the waste sector, the use of "NE" and "IE" to report all categories was not explained in the NIR or in CRF table 9. In most cases, the Party provided some justification in a comment in specific cells of CRF tables 5.A, 5.B, 5.C and 5.D; however, no justification was provided for several uses of "NE" and "IE".
			During the review, the Party indicated that it made efforts to provide justification for the use of all notation keys in the NIR and in CRF table 9. The ERT considers that the recommendation has not yet been fully addressed since both information and justification for the use of notation keys are still missing in the NIR and in CRF table 9 for several categories.
G.6	Notation keys (G.24, 2021) Convention reporting adherence	Provide information in the NIR on insignificant categories reported as "NE" in line with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and demonstrate that the total national aggregate of insignificant categories that are not estimated remains below 0.1 per cent of the national total GHG emissions.	Addressing. The Party provided information in the NIR on some categories considered insignificant and reported as "NE" but not on all of them. Information was not provided in the NIR on waste sector emissions (reported in CRF tables 5.A, 5.B and 5.C) that are considered insignificant by the Party. The Party did not demonstrate that the total national aggregate of categories considered insignificant that are not estimated remains below 0.1 per cent of the national total GHG emissions. During the review, the Party indicated that it will include correct information in the CRF tables and the NIR of the next inventory submission on categories considered insignificant and reported as "NE".
G.7	QA/QC and verification (G.12, 2021) (G.15, 2019) (G.5, 2017) (G.5, 2016) (G.5, 2015) (table 3, 2013) (19, 2012) Convention reporting adherence	Put in place robust QA/QC procedures, in particular for the key categories.	Resolved. The Party has put in place robust and detailed QA/QC procedures for the GHG inventory, which are described in NIR sections 1.2.2–1.2.3 (pp.15–19).
G.8	QA/QC and verification (G.16, 2021) (G.24, 2017) Convention reporting adherence	Include in the NIR detailed information on the QA/QC arrangements in place in accordance with the UNFCCC Annex I inventory reporting guidelines, including information on the QA/QC plan and on QA/QC procedures already implemented or planned to be implemented in the future.	Resolved. The Party included in NIR sections 1.2.2–1.2.3 (pp.15–19) detailed information on its QA/QC arrangements elaborated in accordance with the UNFCCC Annex I inventory reporting guidelines, including information on the QA/QC plan and on QA/QC procedures. The Party has also added sector-specific information on its QC procedures, which include documenting the selection of AD and EFs; verifying the formulas and units used to estimate the emissions for the entire time series; checking the consistency of the entered data and the methods used for the entire time series; comparing current estimates with those for previous years; and analysing trends in AD.
G.9	Recalculations (G.20, 2021) (G.21, 2019) (G.16, 2017) (G.17, 2016)	Report in the NIR complete information on the recalculations relating to previously submitted inventory data, in particular in	Addressing. The Party included information in specific sections of the NIR for most of the recalculations performed for the relevant categories, but did not include information on the impact of the recalculations or their effect on the trend in emissions (e.g. in sections 3.3.2.5 (pp.75–76), 4.3.1.5 (p.99) and 4.3.8.5 (p.110)). During the review, the Party clarified that the

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
(G.17, 2015) Transparency		relation to recalculations made in response to the review process and include a discussion on the impact of the recalculations on the trend in emissions.	impact of the recalculations on the emission trend for 1990–2019 is insignificant. The ERT considers that the recommendation has not been fully addressed since the effect of the recalculations on the emission estimates was not described for all categories and no information was provided in the NIR on the impact of the recalculations on the trend in emissions, such as the recalculation of the CO_2 emission estimates for biomass under subcategory 1.A.1.c manufacture of solid fuels and other energy industries, which decreased by 88.8 per cent for 2005–2020 compared with the 2022 inventory submission.
G.10	Time series (G.15, 2021) (G.18, 2019) (G.18, 2017) (G.19, 2016) (G.19, 2015) Convention reporting adherence	Provide more extensive information on the reasons for observed trends in emissions across the time series at the sectoral level and for the most important categories within these sectors.	Addressing. The Party reported in NIR section 2.2 (p.38) a general description of the trends in emissions, by gas, between 1990 and 2021. For some sectors, explanations were provided in the NIR for the long-term emission trend and for significant inter-annual changes in emissions, for example for the IPPU sector (section 4.1.1 (pp.78–79)), agriculture sector (section 5.1 (pp.155–158)) and LULUCF sector (sections 6.1.1 and 6.2 (pp.199–200 and 201–217 respectively)). For the remaining sectors, the Party only provided in the NIR emission estimates for the beginning and end of the time series (1990 and 2021), without describing the main drivers for the trends or explaining any irregularities in the observed significant inter-annual changes. For example, the drivers for the emissions from the waste sector were not explained in the NIR, and the long-term emission trend was explained for the energy sector only (NIR section 3.1 (p.40)). During the review, the Party explained that it is making efforts to fully address this issue and include the required information in the NIR. The ERT considers that the recommendation has not been fully addressed since more extensive information on the reasons for observed trends in emissions across the time series was not provided for all sectors and for the most important categories.
G.11	Uncertainty analysis (G.21, 2021) (G.22, 2019) (G.13, 2017) (G.13, 2016) (G.13, 2015) (table 4, 2013) (14 and 15, 2012) Convention reporting adherence	Include an explanation for the observed changes in the reported uncertainty estimates between inventory submissions in the NIR; use only well-documented country-specific values for parameters in the uncertainty analysis; and report how the uncertainty analysis is used to prioritize inventory improvements.	Not resolved. The Party reported an uncertainty assessment excluding and including the LULUCF sector in NIR tables 1.4–1.5 (pp.26–31 and 31–36 respectively). The Party indicated in the NIR (p.26) that the uncertainty of the AD corresponds to the uncertainty of the statistical information compiled from data provided by Belstat, but also from ministries and enterprises. Further information on the sources of the sector-specific uncertainty of the AD was included in several sectoral chapters of the NIR on uncertainty. However, the sources of the country-specific uncertainty values used for the AD were not well-documented for all sectors. The uncertainty of the EFs was based on values from the 2006 IPCC Guidelines. The ERT noted some changes in the uncertainties reported in NIR tables 1.4–1.5 between the 2022 and 2023 inventory submissions which were not explained or documented in the NIR. During the review, the Party informed the ERT that only the key category analysis is used to prioritize inventory improvements. Nevertheless, the ERT noted that it is good practice to also use the uncertainty analysis to prioritize inventory improvements, in line with paragraph 42 of the UNFCCC Annex I inventory reporting guidelines and the 2006 IPCC Guidelines (vol. 1, chap. 3, p.3.6). The ERT considers that the recommendation has not been addressed since no explanations were provided in the NIR for the observed changes in the reported uncertainty estimates between inventory submissions, the sources of the country-specific uncertainty values for the AD were not well-documented for all sectors, and no information was provided on whether the uncertainty analysis is used to prioritize inventory improvements.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
G.12	Uncertainty analysis (G.22, 2021) (G.23, 2019) (G.23, 2017) Convention reporting adherence	Perform and report on the uncertainty assessment by including information on the quantitative estimates of the uncertainty of the data used for all source and sink categories using the 2006 IPCC Guidelines.	Addressing. The Party reported an uncertainty assessment excluding and including the LULUCF sector in NIR tables 1.4–1.5 (pp.26–31 and 31–36 respectively). The Party has improved the uncertainty analysis, as the base year and latest reported year for the uncertainty estimates were corrected and all technical data from the Excel spreadsheets that were used to estimate the uncertainties were transferred correctly to the NIR. During the review, the Party confirmed that the technical error previously detected was corrected in November 2021. However, the ERT considers that the recommendation has not yet been fully addressed since uncertainty values for CO_2 emissions for category 4.E.2 land converted to settlements and for N_2O emissions for category 4.D wetlands were not included in NIR table 1.5 and therefore the uncertainty analysis is not complete. In addition, the AD uncertainties reported in NIR table 1.5 for the LULUCF sector were inconsistent with those reported in the LULUCF chapter of the NIR (see ID# L.2 below).

Energy

ID#	Issue classification	Recommendation from previous review report	ERT assessment and rationale
E.1	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.1, 2021) (E.1, 2019) (E.1, 2017) (E.1, 2016) (E.1, 2015) (20, 2013) (32, 2012) Transparency	Improve transparency and include detailed information on EFs and AD in the NIR, for example, by including summary tables of the AD and EFs used for the inventory estimations together with a clear description of the sources thereof, and by providing clear indications of the methodology used.	Resolved. The Party reported transparent information on and descriptions (including summary tables) of the EFs, AD and estimation methods used, as well as their sources, in NIR sections 3.2.4.2 (energy industries), 3.2.5.2 (manufacturing industries and construction), 3.2.6.2 (transport), 3.2.7.2 (other sectors), 3.2.8.2 (other) and 3.3.2.2 (oil, natural gas and other emissions from energy production) (pp.47–50, 52–55, 57–59, 62–64, 66–68 and 72–73 respectively). In NIR table 3.4 (section 3.2.1, pp.43–44) Belarus reported the NCVs and carbon content values for the relevant fuels that were used to calculate CO_2 emissions under the reference approach, including the sources of the data.
E.2	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.2, 2021) (E.2, 2019) (E.2, 2017) (E.2, 2016) (E.2, 2015) (21, 2013) (44, 2012) Accuracy	Use country-specific EFs for key categories.	Addressing. The Party reported in NIR table 3.9 (pp.49–50) the country-specific CO_2 EFs used to estimate emissions from natural gas, gasoline, diesel oil, fuel oil and LPG. Further, Belarus reported in NIR table 3.31 (p.73) that CH_4 emissions for natural gas transport under subcategory 1.B.2.b.4 transmission and storage were calculated by JSC Gazprom Transgaz Belarus using a country-specific method. However, Belarus still used IPCC default EFs to estimate CO_2 emissions from solid fuels (other bituminous coal and coke oven coke), peat briquettes/peat and liquid fuels (crude oil, jet kerosene, other kerosene, refinery gas and other petroleum products) for the key categories and subcategories 1.A.1 energy industries, 1.A.2 manufacturing industries and construction, 1.A.3.a domestic aviation, 1.A.3.c railways, 1.A.4 other sectors and 1.A.5.a stationary. In addition, the Party still used IPCC default CH_4 EFs to estimate fugitive CH_4 emissions for the key subcategory 1.B.2.a oil and for the subcategories under the key category 1.B.2.b natural gas, except for subcategory 1.B.2.b.4 (annex 1 to the NIR, tables 1.1–1.6, pp.290–331). During the review, the Party provided a comprehensive table showing the methods and EFs applied for each category and gas in the energy sector. The ERT considers that the recommendation has not yet been fully addressed because the Party did not use country-specific CO_2 EFs for the above-mentioned fuels and key categories and country-specific CH_4 EFs for fugitive emissions for the above-mentioned key categories (see ID#s G.3 above and G.13 in table 5).

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E.3	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.4, 2021) (E.4, 2019) (E.5, 2017) (E.5, 2016) (E.5, 2015) (23, 2013) Comparability	Implement QC procedures to ensure the correct and consistent use of notation keys.	Addressing. The Party reported in the NIR (section 1.2.3, pp.17–19) information on its QA/QC and verification system, without providing a specific reference to QC procedures to ensure the correct and consistent use of notation keys. In CRF table 1.B.2, the Party replaced the incorrect notation key "NA" previously used to report the CO_2 IEF and CO_2 emission estimates for subcategory 1.B.2.a.4 refining/storage with "NE". For subcategory 1.B.2.a.5 distribution of oil products, the incorrect notation key "NO" previously used to report the AD was replaced with an AD value. The IEFs and CO_2 and CH_4 emission estimates previously reported as "NO" were reported as "NE" for this subcategory. In addition, the Party reported GHG precursor emissions (NO_X, CO, NMVOCs and SO_2) as "NE" instead of "NO" (as previously reported) in the corresponding CRF tables for categories 1.A.1 energy industries, 1.A.2 manufacturing industries and construction, 1.A.4 other sectors and 1.A.5 other. Explanations for reporting these precursor emissions as "NE" were included in CRF table 9. However, the Party continued, in some cases, to use notation keys inconsistently and incorrectly across the time series. For example, in CRF table 1.A.(a) the Party reported "NO" for the AD for solid fuels under subcategory 1.A.5.b mobile for 1990–2021 but reported the CO_2 emissions from solid fuels for this subcategory as "IE" for 2010. The ERT also noted that in CRF table 1.A(a) the Party reported the AD and emissions for peat under subcategory 1.A.4.a commercial/institutional as "NA" for 2016–2021 but reported values for the AD and emissions for 1990–2015. During the review, the Party explained that there was no activity under subcategory 1.A.4.a for 2016–2021, and that it will change the notation key from "IE" to "NO" for subcategory 1.A.5.b for 2010 and the notation key "NA" to "NO" for the AD and emissions for peat under subcategory 1.A.4.a for 2016–2021 in the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not comprehensively implement QC procedures to ensure the correct and consistent use of notation keys across the time series and the GHG inventory.
E.4	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.5, 2021) (E.5, 2019) (E.23, 2017) (E.31, 2016) (E.31, 2015) Convention reporting adherence	Include the relevant information on changes made to address recommendations made in previous review reports, as requested in paragraph 50(i) of the UNFCCC Annex I inventory reporting guidelines.	Resolved. In NIR sections 2.3.4.5–3.2.8.5 and 3.3.2.5 (pp.51, 56, 60, 65, 69 and 76 respectively) the Party reported that the relevant descriptions of changes made to address recommendations from previous review reports were included in sections 2.3.4.5, 3.2.5.5, 3.2.6.5, 3.2.7.5, 3.2.8.5 and 3.3.2.5 of the NIR of the 2022 inventory submission (pp.58–59, 66–67, 72–74, 81–82, 87–88 and 94–95, respectively). The ERT confirmed that the required information was provided as indicated by the Party.
E.5	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.6, 2021) (E.7, 2019) (E.36, 2017) Convention reporting adherence	Provide information in CRF table 9 explaining the reasons for the use of the notation keys "IE" and "NE".	Resolved. Belarus explained in CRF table 9 that the AD and CO_2, CH_4 and N_2O emissions for subcategories 1.A.2.b non-ferrous metals (gaseous fuels), 1.A.2.d pulp, paper and print (liquid, solid and gaseous fuels, peat and biomass), 1.A.3.a domestic aviation (aviation gasoline), 1.A.3.b.i cars (gasoline, diesel oil, LPG and gaseous fuels), 1.A.3.b.ii light-duty trucks (gasoline, diesel oil, LPG and gaseous fuels), 1.A.3.b.iii heavy-duty trucks and buses (gasoline, diesel oil, LPG and gaseous fuels), 1.A.3.b.iv motorcycles (gasoline, diesel oil, LPG and gaseous fuels), 1.B.2.c.i oil (venting) (CO_2 and CH_4 emissions), 1.B.2.c.ii gas (venting) (CO_2 and CH_4 emissions), 1.B.2.c.iii combined (venting) (CO_2 and CH_4 emissions), 1.B.2.c.i oil

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			(flaring) (CO_2, CH_4 and N_2O emissions), 1.B.2.c.ii gas (flaring) (CO_2, CH_4 and N_2O emissions) and 1.B.2.d other (natural gas transport) (CH_4 emissions) were reported as "IE" owing to the structure of the national statistics. Further, the Party explained in CRF table 9 that subcategories 1.B.2.a.4 refining/storage (CO_2 and N_2O emissions), 1.B.2.a.5 distribution of oil products (CO_2 and CH_4 emissions) and 1.B.2.a.6 other (CO_2 and CH_4 emissions) were reported as "NE" because the 2006 IPCC Guidelines do not provide default EFs for these subcategories. The ERT considers the information provided by the Party to be complete and accurate.
E.6	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.7, 2021) (E.8, 2019) (E.36, 2017) Transparency	Provide information in the NIR on the changes made to the notation keys since the previous submission.	Resolved. In NIR sections 3.2.4.5–3.2.7.5 and 3.3.2.5 (pp.51, 56, 60, 65, 69 and 76 respectively) Belarus reported that the reasons for the changes to the notation keys between the 2021 and 2022 inventory submissions were included in sections 3.2.4.5, 3.2.5.5, 3.2.6.5, 3.2.7.5 and 3.3.2.5 of the NIR of the 2022 inventory submission (pp.58–59, 66, 72–74, 81 and 95 respectively). In NIR sections 3.2.6.5 and 3.3.2.5 (pp.60 and 75–76 respectively), Belarus reported the changes in the use of notation keys between the 2022 and 2023 inventory submissions. For subcategories 1.A.3.b.i–1.A.3.b.iv under 1.A.3.b road transportation, the notation key "IE" was changed to "NO" for biomass. For subcategory 1.B.2.b.6 other, "NO" was replaced with values for the AD and emissions for natural gas storage facilities. The ERT confirmed the changes made by the Party; however, it noted that the allocation of AD and emissions for natural gas storage facilities under subcategory 1.B.2.b.6 is not in accordance with the allocation required in CRF table 1.B.2 (see ID# E.56 below). The ERT noted that the reasons for using "IE" and "NE" were also reported in CRF table 9 of the 2023 inventory submission.
E.7	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.54, 2021) Transparency	Provide in the NIR detailed and consistent information on the improvements planned for the energy sector.	Not resolved. In NIR section 8.4 (p.289), the Party provided a general reference indicating that information on improvements planned for individual categories of the energy sector was provided in NIR sections 3.2.4.6–3.2.8.6 and 3.3.2.6. However, in those sections, the Party reported that no improvements are currently planned for categories of the energy sector. Furthermore, the Party did not provide detailed information in the NIR on planned improvements for pending issues for the energy sector, such as the use of country-specific EFs for key categories (see ID# E.2 above) or the correct allocation and subsequent recalculation of fuel consumption amounts for BKB and peat (see ID#s E.9 and E.10 below). During the review, the Party indicated that NIR sections 3.2.6.5 and 3.3.2.5 (pp.60 and 75–76 respectively) contain information on implemented improvements that were described in sections 3.2.6.6 and 3.3.2.6 of the NIR of the 2022 inventory submission. The ERT considers that the recommendation has not yet been fully implemented as the Party did not mention in the NIR any planned improvements for pending issues for the energy sector.
E.8	1. General (energy sector) – solid fuels – CO_2, CH_4 and N_2O (E.8, 2021) (E.9, 2019) (E.37, 2017) Accuracy	Report the AD and emissions for different coal types separately according to the statistical data for the years after 2011 and apply the statistical tools provided in the 2006 IPCC Guidelines to 1990–2010 to	Resolved. In NIR sections 3.2.4.5–3.2.7.5 (pp.51, 56, 60, 65 and 69 respectively) Belarus indicated that changes in response to the recommendations from the 2021 review report were reported in sections 3.2.4.5–3.2.7.5 of the NIR of the 2022 inventory submission (pp.59, 66, 73, 81, 82 and 87 respectively). The Party stated in those sections of the NIR of the 2022 inventory submission that on the basis of consultations with Belstat, it was clarified that the NCVs, carbon content and CO_2, CH_4 and N_2O EFs for coal types consumed in Belarus correspond only

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		resolve data gaps and ensure time-series consistency.	to "other bituminous coal" as provided in the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1, p.1.14). Belarus used IPCC default values for other bituminous coal according to tables 1.2, 1.4 and 2.2–2.5 of the 2006 IPCC Guidelines (vol. 2, chaps. 1–2, pp.1.18, 1.23 and 2.16–2.23 respectively), instead of the previously used default values for lignite, and recalculated the AD (using the available statistical data) and emission estimates accordingly for the whole time series, which resolved the previous data gaps and ensured the time-series consistency of the estimates, as shown in NIR tables 3.8 and 3.13 (pp.49 and 54 respectively).
E.9	1. General (energy sector) – solid fuels – CO_2, CH_4 and N_2O (E.55, 2021) Comparability	Ensure the correct allocation of fuel amounts in line with the IPCC fuel categorization (2006 IPCC Guidelines, vol. 2, table 1.1) and correct the reporting in relation to BKB and peat in CRF table 1.A(b) on the basis of information to be collected on the use of these fuel types and their parameters. Make the necessary reallocations and corrections in the reporting for all categories under the sectoral approach where peat briquettes are used.	Not resolved. In CRF table 1.A(b), the Party still reported an apparent consumption of –1,083.36 TJ for BKB for 2021. The Party explained, for example in NIR tables 3.8–3.9 (p.49), that the fuel quantities previously reported as "lignite briquettes" or "brown coal briquettes" were classified as "peat briquettes" in the 2023 inventory submission. Accordingly, the carbon EF for peat was used and reported in CRF table 1.A.(b) and the corresponding CO_2, CH_4 and N_2O EFs for peat were used for all categories for which emissions from peat were estimated under the sectoral approach. However, the ERT noted that in NIR section 3.2.1 and tables 3.8 and 3.13 (pp.43, 49 and 54 respectively), Belarus still indicated that "peat briquettes" were allocated under solid fuels under the reference approach and under all categories under the sectoral approach. During the review, the Party stated that peat briquettes are dry secondary fuels produced from peat that do not correspond to the definition of peat provided in the 2006 IPCC Guidelines. The ERT considers that this statement is not consistent with the definition of fuel types in the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1, pp.1.12–1.16), which also classify peat in compressed form (briquettes) as peat, because the primary source of peat briquettes is peat. The ERT further considers that the recommendation has not yet been implemented as the Party did not apply the necessary reallocations and corrections in its reporting in CRF table 1.A.(b) and for all categories under the sectoral approach where peat briquettes are used.
E.10	1. General (energy sector) – solid fuels – CO_2, CH_4 and N_2O (E.55, 2021) Transparency	Report in the NIR information on the applied reallocations and recalculations.	Resolved. The Party indicated in its NIR (tables 3.8–3.9 and 3.12–3.13, pp.49 and 53–54 respectively) that the fuel quantities previously reported as "lignite briquettes" or "brown coal briquettes" were classified as "peat briquettes" and allocated under solid fuels in the 2023 inventory submission. Accordingly, the carbon EF for peat was used and reported in CRF table 1.A.(b) and the corresponding CO_2, CH_4 and N_2O EFs for peat were used for all categories for which emissions from peat were estimated under the sectoral approach. The ERT noted, however, that this allocation is not in line with the fuel categorization provided in the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1, pp.1.12–1.16) (see ID# E.9 above).
E.11	Fuel combustion – reference approach – all fuels – CO_2 (E.10, 2021) (E.10, 2019) (E.7, 2017) (E.7, 2016) (E.7, 2015) (26, 2013) (35,	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach.	Addressing. The ERT noted the progress made by the Party in reducing the difference between the reference approach and the sectoral approach across the time series; however, significant differences remain for certain years (e.g. –8.8 per cent for 2021). The Party reported in its NIR (p.43) that these differences are mainly due to differences in the CO_2 emission estimates for liquid fuels over the time series, which include a wide variety of petrochemical products subject to export and import. The Party further explained that differences in CO_2 emissions for solid fuels and peat were due to the fact that peat briquettes are produced from peat and classified as

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	2012) Transparency		solid fuels. During the review, the Party stated that the main reasons for the observed differences were investigated and explained in NIR section 3.2.4 (p.46). However, the ERT was unable to find such an explanation in NIR section 3.2.4. The ERT considers that the recommendation has not yet been fully addressed because the Party did not explain and provide details of its investigations on how the wide variety of petrochemical products used for combustion and imported or exported leads to differences between the reference approach and the sectoral approach. In its comments on the provisional main findings of the ERT, the Party indicated that the differences between the two approaches are due to the double counting of crude oil and bitumen along with the crude oil from which bitumen is produced for the accounting of carbon stored.
E.12	Fuel combustion – reference approach – all fuels – CO_2 (E.12, 2021) (E.13, 2019) (E.32, 2017) (E.40, 2016) (E.40, 2015) Convention reporting adherence	(a) Account for exports of jet kerosene; (b) Account for exports of bitumen; (c) Estimate carbon stored; (d) Enhance verification procedures to ensure the consistency of information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d); (e) Include detailed information on the improvements made in the NIR of the next inventory submission.	(a) Resolved. The Party reported and accounted for jet kerosene exports in CRF table 1.A(b) for the entire time series; (b) Resolved. The Party reported and accounted for exports of bitumen in CRF table 1.A(b) for the years when this activity occurred (1995–2021); (c) Resolved. Belarus estimated carbon stored (carbon excluded) for naphtha and reported the estimates in CRF table 1.A(b), which were previously reported as "NO"; (d) Addressing. The Party has enhanced its verification procedures to ensure that the information reported in CRF tables 1.A(b), 1.A(c) and 1.A(d) is consistent. During the review, the Party indicated that consistency of information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d) was ensured. However, the ERT noted that some inconsistencies remain between the three CRF tables with regard to reporting the carbon stored associated with NEU of naphtha and peat (see ID# E.17 below); (e) Resolved. The Party reported in its NIR (p.44) that a description of changes made in the context of the issues raised during the 2021 review was provided in the NIR of the 2022 inventory submission. The ERT confirmed that detailed information on the improvements made to the estimates under the reference approach was included in the NIR of the 2022 inventory submission (pp.49–50).
E.13	Fuel combustion – reference approach – liquid fuels – CO_2 (E.13, 2021) (E.14, 2019) (E.41, 2017) Convention reporting adherence	Correct the reporting of AD for jet kerosene imports in CRF table 1.A(b).	Resolved. The Party corrected the information reported in CRF table 1.A(b) on imports of jet kerosene by rectifying the previously identified discrepancies with the data contained in the energy balance.
E.14	Fuel combustion – reference approach – liquid fuels – CO_2 (E.56, 2021)	Ensure consistency between the information reported in the NIR and CRF tables 1.A(b), 1.A(d) and 2(I).A-H (sheet 2) on the NEU of paraffin wax.	Not resolved. The Party reported 53.58 kt of paraffin wax consumption under NEU of products from fuels and solvent use in CRF table 2(I).A-H (sheet 2) for 2021. This quantity of paraffin wax for NEU is similar to the value reported in NIR table 4.22 (pp.117–118). However, in CRF tables 1.A(b) and 1.A(d), "NO" was reported for the entire time series for "other oil", which is the required allocation of paraffin wax in the CRF tables, leading to inconsistencies between

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	Convention reporting adherence		these two CRF tables and CRF table 2(I).A-H (sheet 2). During the review, the Party indicated that it had ensured the consistency of the information on the NEU of paraffin wax reported in CRF tables 1.A(b), 1.A(c) and 1.A(d). The ERT noted that the information reported in the NIR and in CRF table 2(I).A-H (sheet 2) on the quantities of paraffin wax used for NEU of fuels is consistent; however, it is inconsistent with the information on paraffin wax used for NEU reported in CRF tables 1.A(b) and 1.A(d).
E.15	Fuel combustion – reference approach – other fossil fuels – CO_2 (E.14, 2021) (E.15, 2019) (E.41, 2017) Convention reporting adherence	Report the correct sign for the carbon stock change for peat (i.e. it should be negative) in CRF table 1.A(b) for the reference approach estimates.	Resolved. The Party corrected the sign used for stock change for peat in CRF table 1.A(b) across the time series and reported a negative value of –4,938.56 TJ for 2021.
E.16	Fuel combustion – reference approach – all fuels – CO_2 (E.15, 2021) (E.50, 2019) Accuracy	Revise the methodology applied to calculate the average of the country-specific carbon contents by applying a weighted average based on fuel consumption per fuel variety and report the correct values in CRF table 1.A(b).	Resolved. The Party revised the methodology applied to calculate the average of the country-specific carbon contents of natural gas, gasoline, diesel oil, residual fuel oil and LPG. The Party reported in NIR table 3.4 (p.43) the NCVs and carbon contents used under the reference approach and reported the correct values in CRF table 1.A(b). During the review, the Party indicated that the methodology applied to calculate the country-specific carbon contents for natural gas, gasoline, diesel oil, residual fuel oil and LPG was established through studies published in scientific peer-reviewed publications. Default NCV and carbon content values were used for all other types of fuel. The Party clarified that the NCV and carbon content values were revised for all fuels reported in the reference approach estimates and are identical with the values used for the sectoral approach estimates.
E.17	Feedstocks, reductants and other NEU of fuels – all fuels – CO_2 (E.17, 2021) (E.18, 2019) (E.12, 2017) (E.12, 2016) (E.12, 2015) (31, 2013) Convention reporting adherence	Ensure consistency across CRF tables 1.A(b), 1.A(c) and 1.A(d).	Addressing. The Party corrected the inconsistencies across CRF tables 1.A(b), 1.A(c) and 1.A(d) identified in previous reviews. The Party reported estimates for carbon stored (carbon excluded) for naphtha in CRF table 1.A(b), which was previously reported as "NO". However, the amount of carbon stored from naphtha was reported in CRF table 1.A(b) as 697.53 kt C, while in CRF table 1.A(d) it was reported as 783.40 kt C. Furthermore, the Party addressed the issue related to the previous reporting in the 2022 inventory submission of "NO" for apparent energy consumption (excluding NEU, reductants and feedstocks) for all fuels in CRF table 1.A(c) by providing estimates for liquid, solid and gaseous fuels even though estimates of carbon stored for peat were not reported in CRF table 1.A(d). The Party also reported amounts of carbon excluded for all fuels except lubricants. The ERT considers that the recommendation has not yet been fully addressed because the information reported across CRF tables 1.A(b), 1.A(c) and 1.A(d) was not fully consistent.
E.18	Feedstocks, reductants and other NEU of fuels – all fuels – CO_2 (E.18, 2021) (E.19, 2019) (E.13, 2017) (E.13, 2016)	Obtain information on the utilization of naphtha, lubricants, coal and coal products as feedstocks and for non-energy purposes; use this information to improve the accuracy of the	Addressing. The Party reported in NIR table 3.5 (p.45) information on the NEU of various types of fuel consistently with the data contained in the energy balance, including naphtha, other bituminous coal and coke oven coke, but did not report information on lubricants and other possible coal and coal products used for NEU. During the review, the Party confirmed that information on the NEU of various types of fuel is presented in NIR table 3.5, which

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	(E.13, 2015) (32, 2013) (43, 2012) Accuracy	emission estimates; and provide detailed relevant explanations in the NIR to improve transparency.	corresponds to the data contained in the national energy balance. The ERT noted that the NEU of lubricants was reported as "NE" in CRF table 1.A(d), which corresponds to the data reported in CRF table 2(I).A-H (sheet 2). The ERT considers that the recommendation has not yet been fully addressed because the Party did not provide information on all fuels used as feedstocks and for NEU, and did not provide in its NIR detailed relevant explanations on NEU of fuels, including how the reported information improved the accuracy of the emission estimates.
E.19	Feedstocks, reductants and other NEU of fuels – crude oil – CO_2 (E.19, 2021) (E.20, 2019) (E.45, 2017) Accuracy	Recalculate the excluded carbon from NEU of fuels for crude oil in accordance with the 2006 IPCC Guidelines using data from the national fuel and energy balance on crude oil used for non-energy purposes and as feedstock for non-fuel products.	Not resolved. The ERT could not identify any recalculations performed with regard to the excluded carbon from NEU of crude oil in the 2023 or 2022 inventory submissions. The ERT noted that the Party reported values for NEU of crude oil for the first time in the 2022 inventory submission, which was previously reported as "NE" in the 2021 inventory submission. The Party made no reference to recalculations in the NIR of its 2023 inventory submission and did not explain whether any recalculations were performed in accordance with the 2006 IPCC Guidelines and whether it used data from the national fuel and energy balance. The ERT also noted that the Party reported in CRF tables 1.A(b) and 1.A(d) data on the excluded carbon from NEU of crude oil and reported "CO_2 emissions from the NEU reported in the inventory" for this fuel as "NE" in CRF table 1.A(d) for the entire time series. During the review, the Party indicated that information on the NEU of various types of fuel is presented in NIR table 3.5 (p.45). The ERT further noted that the information reported in CRF table 1.A(d) on the total amount of crude oil for NEU is inconsistent with the amount reported in the national energy balance. For example, the quantity of crude oil for NEU reported in CRF table 1.A(d) for 2019 is 93,060 TJ, while the energy balance provides a value of 205 TJ. Similarly for 2020, the quantity of crude oil used for NEU reported in CRF table 1.A(d) is 97,290 TJ, while the value reported in the energy balance is 117 TJ. The ERT observed a similar inconsistency when comparing the information on the NEU of various types of fuel reported in NIR table 3.5 with the information reported in the national energy balance. For example, for 2020, a value of 54,315 TJ was reported for natural gas in NIR table 3.5, while a value of 53,590 TJ is provided in the energy balance. The ERT concluded that the issue has not been addressed as the Party did not perform recalculations associated with the excluded carbon from NEU of crude oil and inconsistencies remain in the information reported on the NEU of fuels between the CRF tables, the NIR and the official national fuel and energy balance.
E.20	International aviation – liquid fuels – CO_2, CH_4 and N_2O (E.20, 2021) (E.21, 2019) (E.10, 2017) (E.10, 2016) (E.10, 2015) (29, 2013) (42, 2012) Transparency	Provide information in the NIR on how jet kerosene is allocated between domestic and international flights for 2000–2011.	Addressing. The Party reported in its NIR (p.44) that data on the quantity of fuel supplied for international aviation were not included in national totals and that these data were provided by Belstat. The Party did not report detailed information on the methodology or assumptions used for allocating jet kerosene consumption between international and domestic aviation. During the review, the Party clarified that Belstat provides information on the distribution of jet fuel consumption between domestic and international aviation. The ERT considers that the recommendation has not yet been fully addressed because the Party did not report in its NIR the methodology or assumptions used by Belstat for allocating jet kerosene consumption between international and domestic aviation.

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E.21	International aviation – liquid fuels – CO_2 (E.21, 2021) (E.51, 2019) Convention reporting adherence	Ensure the consistency of the values reported for jet kerosene under international bunkers between CRF tables 1.A(b) and 1.D.	Resolved. The values reported by the Party for jet kerosene under international bunkers are consistent between CRF tables 1.A(b) and 1.D for the entire time series.
E.22	1.A Fuel combustion – sectoral approach – liquid, gaseous and other fossil fuels – CO_2, CH_4 and N_2O (E.16, 2021) (E.17, 2019) (E.33, 2017) (E.41, 2016) (E.41, 2015) Transparency	Provide documented information on the country-specific NCVs used in the emission calculations, with the aim of demonstrating the accuracy of those values.	Not resolved. The Party reported in NIR table 3.4 (p.43) the values and sources of the EFs and NCVs used for the CO_2 emission calculations under the reference approach, which were also used under the sectoral approach, for category 1.A fuel combustion, including the country-specific NCVs used. Documentation on the country-specific NCVs was not included in the NIR. During the review, the Party clarified that the country-specific NCVs used in the emission calculations were based on studies, and provided the ERT with weblinks to published peer-reviewed reports. The documents referenced outline the processes involved in obtaining the NCVs from external agencies. For natural gas, the NCV and carbon content data were from Gazprom VNIIGAZ LLC and Gazprom OJSC, while for liquid fuels (gasoline, diesel oil, residual fuel oil and LPG) the data were from the Republican Scientific Research Unitary Enterprise "BEL NIC Ecology". The ERT considers that this matter has not been resolved because the Party did not provide documented information in the NIR to demonstrate the accuracy of the country-specific NCVs used.
E.23	1.A Fuel combustion – sectoral approach – all fuels – CO_2 (E.22, 2021) (E.22, 2019) (E.14, 2017) (E.14, 2016) (E.14, 2015) (33, 2013) (44, 2012) Accuracy	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels.	Addressing. In NIR table 3.4 (p.43), the Party reported the NCVs and carbon content values used for the CO_2 emission estimates for the reference approach, which also were used for the sectoral approach, including country-specific carbon content values. The ERT noted that according to NIR table 3.4 the Party still applied default carbon content values from the 2006 IPCC Guidelines for peat and other bituminous coal used in stationary combustion activities for key categories. No information justifying the continued use of default CO_2 EFs for key categories was included in the NIR nor was information provided on any planned improvements to apply country-specific carbon content factors for fuels consumed for key categories. During the review, the Party did not provide any additional information justifying the use of default carbon content values or on any planned improvements to implement country-specific carbon content values for the remaining fuels consumed for key categories. The ERT considers that the recommendation has not yet been fully resolved because the Party did not follow the IPCC good practice of using country-specific carbon content values for all fuels used for key categories.
E.24	1.A Fuel combustion – sectoral approach – biomass – CO_2 (E.24, 2021) (E.24, 2019) (E.38, 2017) Transparency	Calculate CO_2 emissions from biomass consumption for categories 1.A.1 and 1.A.2 and report estimates in the sectoral approach categories and memo items.	Resolved. The Party reported AD and CO_2 emissions from biomass consumption for category 1.A.1 energy industries in CRF table 1.A(a) (sheet 1) and for category 1.A.2 manufacturing industries and construction in CRF table 1.A(a) (sheet 2). It also reported CO_2 emissions from biomass as a memo item in CRF table 1 (sheet 2). The ERT considers that the recommendation has been fully addressed.
E.25	1.A Fuel combustion – sectoral approach – liquid	Report emissions from refinery gas combustion in all categories where it	Resolved. The Party reported in NIR section 3.2.4.1 (p.47) of the 2023 inventory submission that hydrocarbon gas from oil refining (refinery gas) is used within subcategory 1.A.1.b

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	fuels – CO_2, CH_4 and N_2O (E.25, 2021) (E.25, 2019) (E.39, 2017) Accuracy	was used for all years of the time series.	petroleum refining. The ERT noted that recalculations of emissions from the redistribution of refinery gas consumption for all years of the time series were reported in the 2022 inventory submission. Recalculations were also reported in NIR section 3.2.4.5 (pp.56–58) of the 2022 inventory submission for activities under subcategories 1.A.1.a public electricity and heat production, 1.A.1.b petroleum refining and 1.A.1.c manufacture of solid fuels and other energy industries, and in NIR section 3.2.5.5 (p.65) for activities under subcategory 1.A.2.c chemicals. In the NIR of the 2022 inventory submission (p.73), the Party confirmed that refinery gas was not used under category 1.A.3 transport. During the review, the Party provided values in TJ for the amounts of liquid fuels consumed under subcategory 1.A.1.b and confirmed that refinery gas is only consumed under that subcategory. The estimates of CO_2, CH_4 and N_2O emissions for liquid fuels for subcategory 1.A.1.b provided by the Party for 2018–2021 are consistent with those reported in CRF table 1.A(a) (sheet 2) for the same years. The ERT considers that the recommendation has been fully addressed.
E.26	1.A Fuel combustion – sectoral approach – all fuels – CO_2, CH_4 and N_2O (E.26, 2021) (E.26, 2019) (E.40, 2017) Transparency	Provide detailed information in the NIR on all country-specific parameters (NCVs, carbon contents and EFs) used for the inventory for the energy sector (e.g. in tabular format).	Resolved. The Party reported in NIR table 3.4 (p.43) the NCVs and carbon content values of the fuels used for the CO_2 emission estimates for the reference approach, which were also used for the sectoral approach. NIR table 3.4 also lists the source of the values for each fuel. The Party also reported the CH_4 and N_2O EFs as well as the NCVs and CO_2 EFs, including country-specific values, in NIR table 3.9 (pp.45–46) for category 1.A.1 energy industries, table 3.12 (p.49) for category 1.A.2 manufacturing industries and construction, table 3.17 (pp.58–59) for category 1.A.3 transport and tables 3.20–3.22 (pp.63–64) for category 1.A.4 other. The ERT considers that the recommendation has been fully addressed as detailed information on all country-specific parameters used for the estimates was provided in the NIR.
E.27	1.A Fuel combustion – sectoral approach – all fuels – CO_2, CH_4 and N_2O (E.27, 2021) (E.27, 2019) (E.40, 2017) Transparency	Explain the methodology used for developing the country-specific parameters (NCVs, carbon contents and EFs) used for the inventory in the energy sector, and provide a justification that the country-specific parameters are more suitable for the national circumstances.	Not resolved. The Party briefly explained in NIR section 3.2.4.2 (pp.47–48) of the 2023 inventory submission how the country-specific parameters were developed or sourced for category 1.A.1 energy industries, in particular for natural gas. This information was also provided in NIR section 3.2.5.2 (pp.52–54) for category 1.A.2 manufacturing industries and construction, section 3.2.6.2 (pp.57–58) for category 1.A.3 transport and section 3.2.7.2 (p.62) for category 1.A.4 other. The Party included information on how the NCVs, carbon content values and EFs were developed in the NIR of the 2022 inventory submission (pp.59, 67, 73, 82 and 87), namely in section 3.2.4.2 (pp.53–55) for category 1.A.1 and section 3.2.5.2 (pp.61–64) for category 1.A.2. During the review, the Party indicated that country-specific parameters for produced and sold gasoline, diesel fuel, residual fuel oil and LPG are provided by the Belarusian State Concern for Oil and Chemistry and that justification for applying in the inventory natural gas country-specific parameters was provided in previous inventory submissions. The ERT considers that the recommendation has not been addressed because explanations on the methodologies used to determine the country-specific parameters and justification for their suitability for the national circumstances were not included in the NIR of the 2023 inventory submission.
E.28	1.A Fuel combustion – sectoral approach – solid	Recalculate CH_4 emissions under categories 1.A.2 and 1.A.4 by	Resolved. The Party reported the CH_4 EFs used for the emission estimates for category 1.A.2 manufacturing industries and construction in NIR table 3.12 (p.53) of the 2023 inventory

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	and gaseous fuels – CH$_4$ (E.28, 2021) (E.52, 2019) Accuracy	applying the correct default CH$_4$ EF for solid and gaseous fuels in accordance with the 2006 IPCC Guidelines (vol. 2, chap. 2, tables 2.3–2.5) and report on the recalculations in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	submission and in NIR tables 3.20–3.22 (pp.63–64) for category 1.A.4 other sectors. The reported EFs are consistent with the default CH$_4$ EFs presented in the 2006 IPCC Guidelines (vol. 2, chap. 2, tables 2.3–2.5, pp.2.18–2.23). The recalculations made for categories 1.A.2 and 1.A.4 applying the correct default CH$_4$ EF for solid and gaseous fuels were explained in the NIR of the 2022 inventory submission (p.65) for the entire time series. The ERT considers that the recommendation has been fully addressed.
E.29	1.A.1.b Petroleum refining – solid and gaseous fuels – CO$_2$, CH$_4$ and N$_2$O (E.29, 2021) (E.30, 2019) (E.16, 2017) (E.17, 2016) (E.17, 2015) (36, 2013) Comparability	Reallocate the emissions from petroleum refining to the energy industries category.	Resolved. The Party reported in NIR section 3.2.4.1 (p.47) of the 2023 inventory submission that emissions from fuels consumed for producing heat within the petroleum industry are reported under subcategory 1.A.1.b petroleum refining. The Party made a reference in NIR section 3.2.4.5 (p.51) of the 2023 inventory submission to the reallocation in the 2022 inventory submission of emissions from petroleum refining to energy industries for the whole time series. The ERT noted that information on the reallocation of emissions was reported in NIR table 3.11 (pp.56–57) of the 2022 inventory submission. The ERT considers that the recommendation has been fully addressed.
E.30	1.A.2 Manufacturing industries and construction – all fuels – CO$_2$, CH$_4$ and N$_2$O (E.30, 2021) (E.32, 2019) (E.16, 2017) (E.17, 2016) (E.17, 2015) (36, 2013) (46, 2012) Comparability	Report disaggregated emission data by subcategory under manufacturing industries and construction.	Addressing. The Party reported in NIR table 3.11 (pp.51–52) of the 2023 inventory submission data on emissions for the complete time series, disaggregated by subcategory under category 1.A.2 manufacturing industries and construction, which correspond to the data reported in CRF table 1.A(a) (sheet 2). Emissions for subcategories 1.A.2.b non-ferrous metals and 1.A.2.d pulp, paper and print were reported as "IE" for 2012–2021. These emissions were reported under subcategories 1.A.2.a iron and steel and 1.A.2.g.iv wood and wood products respectively. During the review, the Party stated that a number of data reallocations were performed and listed in NIR tables 3.13 and 3.18 (pp.60 and 65 respectively) of the 2022 inventory submission. The ERT considers that the recommendation has not been fully addressed because although disaggregated emission estimates were reported for most of the subcategories, not all emissions were disaggregated by subcategory under category 1.A.2.manufacturing industries and construction.
E.31	1.A.2.a Iron and steel – solid fuels – N$_2$O (E.31, 2021) (E.53, 2019) Accuracy	Recalculate N$_2$O emissions by applying the correct EFs in accordance with the 2006 IPCC Guidelines (vol. 2, chap. 2, table 2.3) and report recalculations in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party listed the N$_2$O EFs used for the calculations in NIR table 3.12 (p.53) of the 2023 inventory submission. These EFs are consistent with the default EFs presented in the 2006 IPCC Guidelines (vol. 2, chap. 2, table 2.3, pp.2.18–2.19). Recalculations applying the correct EFs for subcategory 1.A.2.a iron and steel together with explanatory information were reported in NIR section 3.2.5.5 (p.65) of the 2022 inventory submission for the entire time series. The ERT considers that the recommendation has been fully addressed.
E.32	1.A.2.a Iron and steel – solid fuels – N$_2$O	Include in the NIR a description of iron and steel production processes,	Resolved. The Party reported in NIR table 3.13 (p.54) the share of different solid fuels consumed under subcategory 1.A.2.a iron and steel for 1990–2021. A description of the Party's

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	(E.32, 2021) (E.53, 2019) Transparency	including the types of fuel used for energy purposes.	steel production processes was included in NIR section 4.4.1.1 (pp.112–113). The ERT considers that the recommendation has been fully addressed.
E.33	1.A.3 Transport – biomass – CO_2, CH_4 and N_2O (E.33, 2021) (E.33, 2019) (E.27, 2017) (E.35, 2016) (E.35, 2015) Completeness	(a) Reallocate CH_4 and N_2O emissions from biomass in road transportation and railways to subcategory 1.A.4.a commercial/institutional; (b) Apply the correct CH_4 and N_2O EFs for wood/wood waste in the calculations; (c) Estimate and report CO_2 emissions from biomass use in the corresponding categories; (d) Use the correct notation key for CH_4 and N_2O emissions from biomass in road transportation and railways if this type of fuel is not used in these categories.	(a) Resolved. The Party reallocated CH_4 and N_2O emissions from biomass from subcategories 1.A.3.b road transportation and 1.A.3.c railways to subcategory 1.A.4.a commercial/institutional for the entire time series; (b) Resolved. The Party reported in CRF table 1.A(a) (sheet 4) the IEFs of 300 kg/TJ CH_4 and 4 kg/TJ N_2O for biomass for subcategory 1.A.4.a commercial/institutional, which correspond to the default EF values for wood/wood waste under stationary combustion provided in the 2006 IPCC Guidelines (vol. 2, chap. 2, table 2.4, p.2.21). The ERT therefore considers that the Party has applied the correct EFs; (c–d) Addressing. In the NIR of the 2023 inventory submission (pp.374–375), the Party indicated that relevant information on the use of biomass in transport was provided in the NIR of the 2022 inventory submission. In the NIR of the 2022 inventory submission (pp.73–74), the Party reported that biomass is not consumed in transport activities and the biomass AD and emission estimates under category 1.A.3 transport were therefore reported as "NO". However, the ERT identified and shared a report with the Party that indicates the presence of biodiesel at retail pumps, that the share of biodiesel was 30 per cent of the total volume of diesel oil sold in Belarus in 2010, and that in one region of the country, 75 per cent of agricultural machinery was converted to use biodiesel (https://core.ac.uk/download/pdf/212979253.pdf). During the review, the Party indicated that the production and consumption of biodiesel was experimental, and that most biodiesel consumption was concentrated in the agriculture sector. The ERT considers that the recommendation has not been fully addressed because it is not clear whether the reporting of CO_2, CH_4 and N_2O emissions from biomass in transport is complete and was performed accurately and whether the share of biodiesel used in agriculture was accurately taken into account in the GHG inventory calculations.
E.34	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O (E.34, 2021) (E.54, 2019) Completeness	Investigate whether aviation gasoline consumption is reported in the national energy balance aggregated with some other type of liquid fuel (i.e. gasoline) and report on the results of this investigation in the NIR.	Resolved. In the NIR of the 2023 inventory submission (pp.375–376) the Party indicated that relevant information on this recommendation was provided in the NIR of the 2022 inventory submission. In the NIR of the 2022 inventory submission (p.74), the Party reported that aviation gasoline was reported together with gasoline in the national energy balance and that the emissions from the consumption of aviation gasoline were included in subcategory 1.A.3.b road transportation. The Party also reported in the NIR of the 2022 inventory submission (p.74) that Belstat indicated that the amount of gasoline consumed by domestic aircraft is insignificant. As a result, the Party changed the reporting of consumption of aviation gasoline and CO_2, CH_4 and N_2O emissions under subcategory 1.A.3.a domestic aviation from "NO" to "IE" in CRF table 1.A(a) (sheet 3) and provided relevant information in CRF table 9. The ERT notes that the information referred to from the NIR of the 2022 inventory submission needs to be included in each GHG inventory to maintain the transparency of the Party's inventory reporting.
E.35	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4	If the AD for consumption of aviation gasoline in small aircraft are	Resolved. The Party concluded from an investigation conducted in 2022 that aviation gasoline is reported together with automotive gasoline in the national energy balance and the

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	and N_2O (E.35, 2021) (E.54, 2019) Completeness	identified and have not yet been accounted for in the inventory, estimate emissions related to the consumption of aviation gasoline.	corresponding emissions from consumption of aviation gasoline were therefore included in subcategory 1.A.3.b road transportation (see ID# E.34 above). The ERT noted that, as a result, emissions related to the consumption of aviation gasoline are accounted for in the GHG inventory.
E.36	1.A.3.b Road transportation – liquid and gaseous fuels – CH_4 and N_2O (E.36, 2021) (E.34, 2019) (E.6, 2017) (E.6, 2016) (E.6, 2015) (24, 2013) Accuracy	Use appropriate CH_4 and N_2O EFs to estimate emissions from road transportation.	Resolved. The Party reported in CRF table 1.A(a) (sheet 3) the CH_4 and N_2O IEFs for natural gas for road transportation (92 and 3 kg/TJ respectively), which correspond to the default EF values provided in the 2006 IPCC Guidelines (vol. 2, chap. 3, table 3.2.2, p.3.21), for all years of the time series. For gasoline and diesel oil, the Party reported in CRF table 1.A(a) the CH_4 and N_2O IEFs (33.0 and 3.2 kg/TJ respectively for gasoline; and 3.9 and 3.9 kg/TJ respectively for diesel oil), which correspond to the default EF values for the vehicle categories "motor gasoline –uncontrolled" and "gas/diesel oil" provided in the 2006 IPCC Guidelines (vol. 2, chap. 3, table 3.2.2, p.3.21).
E.37	1.A.3.b Road transportation – liquid fuels – CO_2 (E.37, 2021) (E.35, 2019) (E.17, 2017) (E.19, 2016) (E.19, 2015) (38, 2013) (48, 2012) Accuracy	Use country-specific CO_2 EFs to estimate emissions for this key category.	Resolved. The Party reported in NIR table 3.17 (pp.58–59) the country-specific EFs used for estimating CO_2 emissions from all liquid fuels used in road transportation.
E.38	1.A.3.b Road transportation – liquid fuels and biomass – CO_2, CH_4 and N_2O (E.58, 2021) Accuracy	Ensure the accuracy and completeness of AD reported for mobile consumption of different fuels under 1.A.3.b road transportation and 1.A.4 other sectors, ensuring that the allocation is in line with the allocation suggested in the 2006 IPCC Guidelines (vol. 2, chap. 2, p.2.9).	Addressing. The Party reported in the NIR of the 2023 inventory submission (p.386) that relevant information on this recommendation was provided in the NIR of the 2022 inventory submission. In the NIR of the 2022 inventory submission (p.74), the Party reported that automotive fuels used for vehicles were reallocated from subcategories under 1.A.2 manufacturing industries and construction and 1.A.4 other sectors to 1.A.3.b road transportation, consistent with the allocation suggested in the 2006 IPCC Guidelines (vol. 2, chap. 2, p.2.9). However, the ERT noted that reporting biomass as being not consumed in transport activities may not be accurate based on a report indicating that biodiesel was sold in Belarus in 2010 (see ID#s E.33 above and E.44 below). During the review, the Party indicated that the production and consumption of biodiesel in Belarus was experimental, and that most biodiesel consumption was concentrated in the agriculture sector. The ERT considers that the issue has not yet been fully addressed because although the Party ensured that the reporting of reallocated AD and emissions for fossil fuels used in transportation was accurate and complete in line with the 2006 IPCC Guidelines, it is not clear whether the reporting of AD and emissions for biomass used in transportation is accurate and complete (see ID#s E.33 above and E.44 below).
E.39	1.A.3.b Road transportation 1.A.4 other sectors – liquid fuels – CO_2, CH_4	Provide detailed information on fuel allocation under category 1.A.4 other sectors in the NIR, including the source of the reported AD,	Resolved. The Party reported in the NIR of the 2023 inventory submission (pp.62–65) detailed information on fuel allocation under category 1.A.4 other sectors, including the source of the reported AD, as well as the types of liquid fuel used and the subcategories of category 1.A.4 other sectors under which the fuels were reported. Recalculations performed as a result of

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	and N$_2$O (E.58, 2021) Transparency	disaggregated information on the types of liquid fuel used, and the subcategory of category 1.A.4 under which the fuels are reported. Explain any recalculations in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	implementing this recommendation were explained and reported by the Party in the NIR of the 2022 inventory submission (pp.71–72).
E.40	1.A.3.b Road transportation – liquid fuels – CO$_2$, CH$_4$ and N$_2$O (E.59, 2021) Accuracy	Ensure the correct allocation of fuel consumption between road transportation and domestic aviation (ensuring gasoline used in aviation is reported under the appropriate subcategory), estimate the related emissions in accordance with the methodologies and EFs provided in the 2006 IPCC Guidelines (vol. 2, chap. 3) and include explanatory information on the recalculations in the NIR.	Not resolved. The Party did not ensure the correct allocation of aviation gasoline consumption between road transportation and domestic aviation. The Party reported in the NIR of its 2023 inventory submission (p.387) that relevant information on this recommendation was provided in the NIR of the 2022 inventory submission. In the NIR of the 2022 inventory submission (p.74), the Party reported that based on consultations with Belstat, the amount of gasoline consumed by domestic aviation is very small and was therefore included in gasoline consumption in road transportation. During the review, the Party indicated that this issue will continue to be part of its inventory improvement plan and that it will investigate solutions to resolve this issue for the next inventory submission. The ERT considers that the recommendation has not yet been addressed because the Party did not correctly allocate the use of aviation gasoline to domestic aviation and ensure accurate emission estimates for this fuel.
E.41	1.A.3.b Road transportation – gaseous fuels – CH$_4$ and N$_2$O (E.57, 2021) Accuracy	Correct the reporting of CH$_4$ and N$_2$O emissions for 1993 and 1995 and include information on the recalculations in the NIR.	Resolved. The Party corrected the reporting of CH$_4$ and N$_2$O emissions by using CH$_4$ and N$_2$O EFs for the use of natural gas in road transportation from the 2006 IPCC Guidelines (vol. 2, chap. 3, table 3.2.2, p.3.21) for all years of the time series. The Party reported information on the recalculations in the NIR of the 2022 inventory submission (p.74).
E.42	1.A.3.b Road transportation 1.A.3.c Railways – solid fuels and other fossil fuels – CO$_2$, CH$_4$ and N$_2$O (E.39, 2021) (E.56, 2019) Comparability	Verify whether lignite and BKB are used for energy or heating and report on the results in the NIR. In case lignite and BKB are used for energy, reallocate the consumption of these fuels to subcategory 1.A.3.c. In case lignite and BKB are used for heating, reallocate the consumption of these fuels used in the railway sector to subcategory 1.A.4.a commercial/institutional.	Resolved. The Party reported in the NIR of the 2023 inventory submission (p.377) that relevant information on this recommendation was provided in the NIR of the 2022 inventory submission. In the NIR of the 2022 inventory submission (p.74), the Party reported that solid fuels are not used in road transportation and that selected quantities of other types of bituminous coal and peat briquettes consumed for stationary combustion were reallocated from subcategories 1.A.3.b road transportation and 1.A.3.c railways to subcategory 1.A.4.a commercial/institutional. As a result, the Party reported CO$_2$, CH$_4$ and N$_2$O emissions from other fossil fuels under subcategory 1.A.3.b as "NO" and revised the CO$_2$, CH$_4$ and N$_2$O emission estimates for solid fuels reported under subcategory 1.A.3.c for all years of the time series in CRF table 1.A(a) (sheet 3). The ERT considers that the recommendation has been fully addressed.
E.43	1.A.4.a Commercial/institutional – all fuels – CO$_2$, CH$_4$ and N$_2$O	Provide disaggregated AD and CO$_2$, CH$_4$ and N$_2$O emission estimates for subcategory 1.A.4.a commercial/institutional for 1990–	Resolved. The Party reported in CRF table 1.A(a) (sheet 4) disaggregated AD and CO$_2$, CH$_4$ and N$_2$O emission estimates for all relevant fuels, including biomass, for 1990–2000 and all other years of the time series. In the NIR of the 2023 inventory submission (p.69) the Party indicated that relevant information on the reallocation and recalculation of emission estimates

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	(E.60, 2021) Consistency	2000, ensuring the time-series consistency of the data in accordance with the 2006 IPCC Guidelines (vol. 1, chap. 5, pp.5.14–5.15), and provide explanatory information in the NIR on the reallocation and recalculation. If disaggregated data are not provided and CO_2 emissions from biomass are not reported, revise the notation keys used (in case of aggregated AD and emissions, "IE" should be used and an appropriate explanation should be provided in CRF table 9, and CO_2 emissions that have not been estimated should be reported as "NE" in CRF table 1.A(a)).	for all relevant fuels, including the reallocation of biomass from category 1.A.3 transport to subcategory 1.A.4.a commercial/institutional, was provided in the NIR of the 2022 inventory submission (pp.80–82).
E.44	1.A.4.c Agriculture/forestry/ fishing – all fuels – CO_2, CH_4 and N_2O (E.61, 2021) Transparency	Improve the transparency of the reporting by providing detailed information on the allocation of AD for all fuels between subcategories 1.A.4.c.i stationary combustion and 1.A.4.c.ii off-road vehicles and other machinery. Explain any significant inter-annual changes in fuel consumption within the subcategories and revise the use of notation keys across the time series in accordance with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines (where a specific fuel is not used for a given year, "NO" should be reported; where aggregated data are reported, "IE" should be reported and an explanation should be provided in CRF table 9).	Addressing. The Party reported in its NIR (pp.62–64) detailed information on the distribution of fuels between subcategories 1.A.4.c.i stationary and 1.A.4.c.ii off-road vehicles and other machinery. The Party did not provide explanations for the significant inter-annual changes in fuel consumption within these subcategories. The notation keys reported in CRF table 1.A(a) (sheet 4) are not in accordance with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines (e.g. for 2006–2007, the Party reported the AD and emissions for liquid fuels for subcategory 1.A.4.c.i as "NA", and for 2000 and 2016–2021 the Party also reported the AD and emissions for peat for subcategory 1.A.4.c.i as "NA"). During the review, the Party clarified that no consumption of liquid fuels for subcategory 1.A.4.c.i occurred in 2006–2007 and that it will change the reporting of the AD and emissions for liquid fuels for 2006–2007 to "NO" in the next inventory submission. The Party also clarified that consumption of peat for subcategory 1.A.4.c.i did not occur in 2000 and 2016–2021 and that it will change the reporting of the AD and emissions for peat for these years to "NO" in the next inventory submission. The Party reported that biomass is not consumed in transport activities and the biomass AD and emissions under subcategory 1.A.4.c.ii were therefore reported as "NO". During the review, the ERT identified and shared a document with the Party that indicates the presence of biodiesel at retail pumps, that the share of biodiesel was 30 per cent of the total volume of diesel oil sold in Belarus in 2010, and that in one region of the country, around 75 per cent of biodiesel was used in the agriculture sector. The Party indicated that the production and consumption of biodiesel was experimental and that most biodiesel consumption was concentrated in the agriculture sector (see ID# E.33 above). The ERT considers that the recommendation has not yet been fully addressed because the Party did not explain any significant inter-annual changes in fuel consumption within subcategories 1.A.4.c.i and 1.A.4.c.ii or revise its use of notation keys across the time series. Further, the information on the use of the notation key "NO" to report

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			the AD and emissions for biomass for subcategory 1.A.4.c.ii is not transparent and might be not correct.
E.45	1.A.4.c Agriculture/forestry/ fishing – all fuels – CH_4 and N_2O (E.62, 2021) Accuracy	Correct the CH_4 and N_2O EFs used for the subcategory and recalculate the corresponding emissions for the entire time series, providing detailed information in the NIR on the EFs used, the fuel mix and the recalculation performed.	Resolved. The Party corrected the CH_4 and N_2O EFs used for the emission estimates for subcategory 1.A.4.c agriculture/forestry/fishing and recalculated the corresponding emission estimates for the entire time series. Detailed information on the EFs used and the fuel mix were reported in the NIR of the 2023 inventory submission (pp.62–64). In the NIR of the 2023 inventory submission (p.65), the Party indicated that relevant information on recalculations was provided in the NIR of the 2022 inventory submission (pp.80–81).
E.46	1.A.5.a Stationary – all fuels – CO_2, CH_4 and N_2O (E.42, 2021) (E.58, 2019) Transparency	Include in the NIR a section to describe the AD, EFs and method applied to calculate emissions under this subcategory.	Addressing. The Party reported in its NIR (pp.66–68) some information describing the AD, EFs and method applied to calculate emissions under subcategory 1.A.5.a stationary. During the review, the Party clarified that CO_2, CH_4 and N_2O EFs from table 2.5 of the 2006 IPCC Guidelines (vol. 2, chap. 2, pp.2.22–2.23) were used in cases where country-specific EFs were not available for the subcategory. The ERT considers that the recommendation has not yet been fully addressed because the Party did not clearly identify in the NIR the methodology or tier method used to calculate the CH_4 and N_2O emission estimates, or provide references for the CH_4 and N_2O EFs used for the emission estimates or for the CO_2 EFs for fuels, in cases where a country-specific CO_2 EF was not available for this subcategory.
E.47	1.A.5.a Stationary – all fuels – CO_2, CH_4 and N_2O (E.43, 2021) (E.58, 2019) Transparency	Collect more information from Belstat to identify whether the fuels reported in the energy balance as "distribution losses" are combusted or released as fugitive emissions and document in the NIR the result of this research. If some of the fuels are not combusted – particularly for natural gas, which might not be combusted – revise the AD and recalculate emissions under subcategory 1.A.5.a by excluding the amount of fuels not combusted and reallocating it under the correct fugitive emissions category (oil or natural gas).	Addressing. The Party reported in its NIR (pp.66–68) that the quantities of fuel reported as losses in the national statistics, including the statistical losses, are used as inputs for the emission estimates for subcategory 1.A.5.a stationary. During the review, the Party clarified that the quantities of fuel reported as losses in the national statistics refers to statistical losses that are not combusted or released as fugitive emissions. The Party further indicated that those quantities will be excluded from the GHG inventory. The ERT considers that the recommendation has not yet been fully addressed because the NIR did not contain any information on investigations performed to identify whether the fuels reported as losses in the national statistics and used as inputs for the emission estimates for subcategory 1.A.5.a stationary are combusted or released as fugitive emissions, nor did the Party revise the AD and recalculate the emission estimates under this subcategory by excluding the amount of fuels not combusted. The ERT reaffirms that, if some of these fuels are released in the form of fugitive emissions, they should be accounted for under subcategories 1.B.2.a oil and 1.B.2.b natural gas.
E.48	1.A.5.b Mobile – all fuels – CO_2, CH_4 and N_2O (E.44, 2021) (E.59, 2019) Convention reporting adherence	Report the correct notation key, "IE", for AD and emissions for this category in CRF table 1.A(a) (sheet 4) and provide explanatory information in CRF table 9 accordingly.	Addressing. The Party reported in CRF table 9 explanatory information for reporting the consumption of liquid fuels (jet kerosene) under subcategory 1.A.5.b mobile as "IE". The ERT noted that the Party reported CO_2 emissions from solid fuels under subcategory 1.A.5.b as "IE" for 2010, but reported the corresponding AD as "NO", while the AD and emissions were reported as "NO" for all other years of the time series. During the review, the Party clarified that it will change the reporting of CO_2 emissions from solid fuels under subcategory 1.A.5.b for 2010 to "NO" in the next inventory submission. The ERT considers that the

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			recommendation has not yet been fully addressed because the Party did not fully revise its use of "IE" for reporting CO_2 emissions from solid fuels under subcategory 1.A.5.b for 2010 in accordance with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines.
E.49	1.A.5.b Mobile – all fuels – CO_2, CH_4 and N_2O (E.45, 2021) (E.59, 2019) Transparency	Include in the NIR a section describing the AD (types of fuels) used in military activities and where emissions are allocated.	Resolved. The Party reported in its NIR (pp.66–67) a description of the AD used in military activities. The Party reported the emissions as "IE" in CRF table 1.A(a) (sheet 4) and provided an explanation for using this notation key in CRF table 9, indicating that emissions from military aviation under subcategory 1.A.5.b mobile were allocated to subcategory 1.A.3.a domestic aviation.
E.50	1.B.2 Oil, natural gas and other emissions from energy production – liquid and gaseous fuels – CH_4 (E.46, 2021) (E.40, 2019) (E.20, 2017) (E.25, 2016) (E.25, 2015) (44, 2013) Convention reporting adherence	Develop QC procedures for the oil and natural gas category in order to ensure the accuracy of estimates, time-series consistency, the correct use of notation keys and the transparency of the information provided in the NIR.	Addressing. The Party reported in NIR section 3.3.2.4 (pp.74–75) that it developed and applied the following tier 1 QC activities for category 1.B.2 oil, natural gas and other emissions from energy production: (1) documenting the information on the selection of AD and EFs; (2) verifying the correctness of formulas and units used for the estimates for the entire time series; and (3) reviewing time-series consistency of AD and methods used. These QC activities have enhanced the accuracy of the estimates, time-series consistency and the correct use of notation keys. However, the ERT noted that no information was included on QC activities implemented to ensure the transparency of the information provided (see ID#s E.51–E.58 below). During the review, the Party indicated that a set of QC procedures was developed and implemented to ensure the transparency of the information presented for category 1.B.2 in the 2022 and 2023 inventory submissions. The ERT considers that the recommendation has not yet been fully addressed because the Party did not report information on QC activities developed and applied to ensure the transparency of the information provided in the NIR.
E.51	1.B.2 Oil, natural gas and other emissions from energy production – liquid and gaseous fuels – CO_2, CH_4 and N_2O (E.47, 2021) (E.43, 2019) (E.29, 2017) (E.37, 2016) (E.37, 2015) Transparency	Use methods and EFs in accordance with the 2006 IPCC Guidelines, and provide in the NIR detailed and documented information on AD and EFs used in the estimation of all gases for all subcategories under fugitive emissions from oil and natural gas.	Addressing. The Party reported the CO_2, CH_4 and N_2O EFs used for subcategories 1.B.2.a oil and 1.B.2.b natural gas in NIR tables 3.30–3.31 (pp.72–73). It also reported that it used methodologies from the 2006 IPCC Guidelines for the emission estimates for these subcategories, except for natural gas transmission, for which a country-specific method was applied. The ERT checked the CO_2, CH_4 and N_2O EFs applied by Belarus and concluded that they are in accordance with the default EF values from the 2006 IPCC Guidelines (vol. 2, chap. 4, table 4.2.5, p.4.55). The ERT found that the country-specific method used by JSC Gazprom Transgaz Belarus for estimating CH_4 emissions for subcategory 1.B.2.b.4 transmission and storage was not explained in the NIR. The NIR (p.72) includes a general equation for estimating CH_4 emissions for oil and natural gas activities, but no information was provided on whether this equation represents the country-specific method or another approach, which AD were used for the estimates when using this equation, or the meaning of the constant value of 106 included in the equation. The ERT found that the units of the EF included in the general equation used to estimate CH_4 emissions (kg CH_4/PJ) are not consistent with the units of the IEF (kg/10^3 m^3 for oil, or kg/10^6 m^3 for natural gas) reported in CRF table 1.B.2. During the review, the Party clarified that the country-specific method used by JSC Gazprom Transgaz Belarus is in line with the national technical code of common practice (TCH 08/17/09/2018 (33140)) and that it will correct the AD units in the general equation used for the estimates in the next inventory submission. It further clarified that relevant QC activities will be reported in

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			NIR section 3.3.2.4 of the next inventory submission. The Party also explained that, in the country-specific method, a number of measured parameters are used to apply a rigorous emissions model to estimate fugitive emissions from natural gas transmission, which corresponds to a tier 3 method according to the decision tree in figure 4.2.1 of the 2006 IPCC Guidelines (vol. 2, chap. 4, p.4.38). After reviewing the national technical code provided by Belarus during the review, the ERT concluded that the country-specific method is in accordance with the tier 3 method from the 2006 IPCC Guidelines (vol. 2, chap. 4, p.4.38) and that it considers most of the AD required for a tier 3 method set out in table 4.2.6 of the 2006 IPCC Guidelines (vol. 2, chap. 4, p.4.66), such as length of pipelines. During the review, the ERT requested detailed AD information on losses in natural gas transmission in Belarus, but the information was not provided by the Party. The ERT considers that the recommendation has not yet been fully addressed because Belarus did not include in the NIR detailed and documented information on the country-specific method, AD and EFs used for estimating CH_4 emissions for subcategory 1.B.2.b.4 transmission and storage.
E.52	1.B.2 Oil, natural gas and other emissions from energy production – liquid and gaseous fuels – CO_2, CH_4 and N_2O (E.48, 2021) (E.44, 2019) (E.30, 2017) (E.38, 2016) (E.38, 2015) Convention reporting adherence	Provide in the NIR detailed and documented information on methods, AD and EFs used in the estimates, in particular when changes in methodologies, sources of information and assumptions are made in relation to recalculations, as well as information on the rationale for these recalculations and their impact on total emissions.	Addressing. The Party reported the EFs used for subcategories 1.B.2.a oil, 1.B.2.b natural gas and 1.B.2.c venting and flaring in NIR tables 3.30–3.31 (pp.72–73) and reported that it used methodologies from the 2006 IPCC Guidelines for the emission estimates for these subcategories, except for natural gas transmission, for which a country-specific method was applied. The Party included in NIR section 3.3.2.5 (p.75) information on recalculations performed for subcategory 1.B.2.b.6 other. The ERT noted that the emission estimates for subcategories 1.B.2.a, 1.B.2.b and 1.B.2.d other were recalculated by correcting the AD units and reallocating the estimates (see ID#s E.51 above and E.55 below), but no detailed information and the rationale for these recalculations and their impact on total emissions were reported in the related section 3.3.2.5 of the NIR. During the review, the Party confirmed that the recalculations for 1990–2021 reported in NIR section 3.3.2.5 included information only on changes for subcategory 1.B.2.b.6 and not for all subcategories under category 1.B.2 oil, natural gas and other emissions from energy production. The ERT considers that the recommendation has not yet been fully addressed because the Party did not report information and the rationale for the recalculations and their impact on total emissions for subcategories 1.B.2.a, 1.B.2.b and 1.B.2.d.
E.53	1.B.2 Oil, natural gas and other emissions from energy production – liquid and gaseous fuels – CO_2 and CH_4 (E.49, 2021) (E.45, 2019) (E.31, 2017) (E.39, 2016) (E.39, 2015) Completeness	Estimate emissions from exploration activities, which may occur in the country, by collecting relevant missing AD in order to provide emission estimates of CH_4, CO_2 and N_2O from oil and natural gas exploration.	Resolved. The Party reported the AD and emissions for subcategories 1.B.2.a.1 exploration (oil) and 1.B.2.b.1 exploration (natural gas) as "NO" in CRF table 1.B.2. The Party included a justification in the NIR (p.69) clarifying the reporting of these subcategories as "NO" and explaining that oil fields were explored in the 1960s and that the natural gas produced in the country is associated gas released during oil production. The ERT considers that the recommendation has been fully addressed.

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E.54	1.B.2 Oil, natural gas and other emissions from energy production – oil and natural gas – CH_4 (E.50, 2021) (E.46, 2019) (E.44, 2017) Transparency	Ensure the correctness of the units used for the AD and EFs for all categories under 1.B.2 oil and natural gas and other emissions from energy production and provide a detailed explanation for the choice of EFs.	Addressing. The Party reported the CO_2, CH_4 and N_2O EFs used for subcategories 1.B.2.a oil and 1.B.2.b natural gas in NIR tables 3.30–3.31 (pp.72–73), which correspond to the CO_2, CH_4 and N_2O IEFs reported in CRF table 1.B.2 for subcategories under category 1.B.2 oil, natural gas and other emissions from energy production. However, the ERT noted that in CRF table 1.B.2, the AD values and units reported for many subcategories under category 1.B.2 do not correspond to the reported descriptions of AD (e.g. 10^3 m^3 versus PJ oil produced). This error applies to the number of wells drilled for subcategory 1.B.2.a.1 exploration (oil); PJ oil produced for subcategory 1.B.2.a.2 production (oil); PJ oil loaded in tankers for subcategory 1.B.2.a.3 transport (oil); PJ oil refined for subcategory 1.B.2.a.4 refining/storage (oil); kt oil refined in other types of fuel for subcategory 1.B.2.a.5 distribution of oil products (oil); PJ oil storage for subcategory 1.B.2.a.6 other (oil); PJ gas produced for subcategory 1.B.2.b.2 production (natural gas); and PJ gas consumed for subcategory 1.B.2.d other (natural gas transport). The NIR (p.72) states that to convert the oil AD from 10^3 t to 10^3 m^3, a coefficient of 0.872 t/m^3 was used, but the ERT could not reproduce the calculations as the AD units reported in CRF table 1.B.2 were still unclear, and the NIR did not include information on the original AD values used. During the review, the Party provided the original values of AD in kt oil produced for 1990–2021 and clarified that the original unit used for gas produced is 10^6 m^3. The ERT verified the calculations using the original AD values provided by the Party for subcategories 1.B.2.a.2 and 1.B.2.b.2 and was able to replicate the AD values reported in CRF table 1.B.2 for oil and natural gas production for 2021 (1,991.50 10^3 m^3 and 213.95 10^6 m^3 respectively). The ERT considers that the recommendation has not yet been fully addressed as the Party did not ensure the correctness of the description of the AD units for many of the subcategories reported in CRF table 1.B.2.
E.55	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.51, 2021) (E.47, 2019) (E.18, 2017) (E.21, 2016) (E.21, 2015) (40, 2013) Transparency	Include in the NIR data on the volume of gas transmission (including any transit amounts) to improve transparency.	Resolved. The Party clarified in the NIR (p.72) that the data provided by JSC Gazprom Transgaz Belarus refer to data on the volume of natural gas transmission, including transit volumes. In addition, the Party reallocated the corresponding AD and CH_4 emissions reported to subcategory 1.B.2.b.4 transmission and storage for 1990–2021 and reported the AD and CH_4 emissions under subcategory 1.B.2.d other as "IE" in CRF table 1.B.2.
E.56	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.52, 2021) (E.48, 2019) (E.43, 2017) Comparability	Include in the AD under subcategory 1.B.2.b.4 gas transmission and storage all gas transmitted by the pipeline system to industrial consumers or natural gas distribution systems, including both produced and imported natural gas, as well as emissions from natural gas storage systems, calculated separately.	Addressing. The ERT found that in addition to including in the NIR data on the volume of gas transmission, including transit amounts (see ID# E.55 above), the Party also reported in CRF table 1.B.2 the corresponding AD and emissions for all gas transmitted by the pipeline system of the country under subcategory 1.B.2.b.4 transmission and storage. However, the ERT noted that in CRF table 1.B.2, the AD and corresponding CO_2 and CH_4 emissions for the Mozyrskoye, Osipovichskoye and Pribugskoye underground natural gas storage facilities operating in Belarus were reported under subcategory 1.B.2.b.6 other instead of under subcategory 1.B.2.b.4 transmission and storage. According to paragraphs 3(c) and 52 of the UNFCCC Annex I inventory reporting guidelines and the 2006 IPCC Guidelines (vol. 2, chap. 4, p.4.35), fugitive emissions from natural gas storage facilities should be allocated and reported under subcategory 1.B.2.b.4 transmission and storage. During the review, the Party clarified that emissions from natural gas storage were allocated under subcategory 1.B.2.b.6

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			instead of subcategory 1.B.2.b.4 in order to avoid the aggregation of emissions and ensure transparency. The Party also indicated that since the 2022 inventory submission, subcategory 1.B.2.b.4 includes fugitive emissions from systems used to transport processed natural gas, including any transit amounts, and that since the 2023 inventory submission, subcategory 1.B.2.b.6 includes fugitive emissions from natural gas storage systems in the three underground storage facilities operating in Belarus. The ERT noted that in order to ensure comparability, the allocation of AD and emissions should follow the allocation provided in CRF table 1.B.2. The ERT considers that the recommendation has not yet been fully addressed because the Party did not report emissions from natural gas storage systems, which are calculated separately, under subcategory 1.B.2.b.4 according to the allocation provided in CRF table 1.B.2 in accordance with the UNFCCC Annex I inventory reporting guidelines.
E.57	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.53, 2021) (E.49, 2019) (E.43, 2017) Transparency	Provide detailed information in the NIR on the methodology used for the emission estimates, and justifications for the completeness of the AD.	Not resolved. Belarus reported the CO_2, CH_4 and N_2O EFs used for subcategories 1.B.2.a oil and 1.B.2.b natural gas in NIR tables 3.30–3.31 (pp.72–73). The Party also reported that it used methodologies from the 2006 IPCC Guidelines for the emission estimates for these subcategories, except for subcategory 1.B.2.b.4 transmission and storage, for which a country-specific methodology was applied. The Party did not provide detailed and documented information on the country-specific methodology used and justifications for the completeness of the AD for subcategory 1.B.2.b.4. During the review, the Party stated that the recommendation was addressed and that information on the methodology used for the emission estimates for category 1.B.2 oil, natural gas and other emissions from energy production was provided in NIR section 3.3.2.2 (p.72). The ERT considers that the recommendation has not yet been addressed because NIR section 3.3.2.2 still needs to provide transparent and detailed information on the methodology and AD used for the emission estimates for subcategory 1.B.2.b.4, as well as justifications for the completeness of the AD.
E.58	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.63, 2021) Accuracy	Provide revised estimates for CO_2 and CH_4 emissions for subcategory 1.B.2.b.4 based on the AD on gas transmission, taking into account transit volumes and clearly documenting in the NIR the country-specific EFs (e.g. any weighted average CH_4 EF value based on volumes of gas and technology used) and methodology used for gas transmission, together with information on any recalculations and/or any planned improvements for the reporting of this key category.	Addressing. The Party revised the estimates of CO_2 and CH_4 emissions for subcategory 1.B.2.b.4 transmission and storage in CRF table 1.B.2 by taking into account the AD on gas transmission, including information on gas transit volumes, and using a country-specific method for estimating CH_4 emissions and a default EF for estimating CO_2 emissions, as stated in the NIR (pp.72–73). During the review, the Party confirmed that the AD reported under subcategory 1.B.2.b.4 refer to all natural gas transported through the country, including transit volumes, and explained that AD and CH_4 emissions for subcategory 1.B.2.d other (natural gas transport) were reported as "IE" because the transit volumes of natural gas were reallocated to subcategory 1.B.2.b.4 in accordance with a previous recommendation (see ID# E.56 above). However, Belarus did not document or provide details in the NIR on the country-specific methodology used by JSC Gazprom Transgaz Belarus for estimating CH_4 emissions for subcategory 1.B.2.b.4 transmission and storage, or provide information in the NIR on the recalculations resulting from the updated AD on gas transmission or on planned improvements (see ID#s E.51, E.52 and E.56 above). The ERT therefore considers that the recommendation has not yet been fully addressed.

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IPPU			
I.1	2.A.1 Cement production – CO_2 (I.20, 2021) Accuracy	Correct AD for this category for the time series, justify the CO_2 EF and its trend, report updated CO_2 emission estimates for the entire time series and include in the NIR information on the recalculations performed in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party reported in NIR section 4.2.1 (pp.80–84) and in CRF table 2(I).A-H (sheet 1) the corrected AD, revised CO_2 EFs and updated CO_2 emission estimates for category 2.A.1 cement production for the entire time series. The ERT noted that the Party had already addressed this recommendation in the 2022 inventory submission, where it justified the CO_2 EF and its trend and included information on the recalculations performed in NIR section 4.2.1.5 (p.104).
I.2	2.A.2 Lime production – CO_2 (I.21, 2021) Transparency	Include in the NIR an explanation of the changes across the time series in the amount of lime produced in the country, as well as information on its uses (including the application of lime to soils).	Resolved. The Party reported in NIR section 4.2.2.1 (pp.85–86) explanations for the inter-annual changes across the time series in the amount of lime produced under category 2.A.2 lime production, as well as information on the uses of lime in the country.
I.3	2.B Chemical industry – CO_2, CH_4 and N_2O (I.5, 2021) (I.6, 2019) (I.9, 2017) (I.11, 2016) (I.11, 2015) Transparency	Ensure that the information in the NIR on emission estimates for this category is fully transparent in accordance with the requirements of the UNFCCC Annex I inventory reporting guidelines and include information on EFs used, references and descriptions of the production processes for the reported subcategories under the category chemical industry.	Addressing. The Party transparently reported in NIR section 4.3 (pp.95–110) the emission estimates, AD and EFs used, as well as descriptions of the production processes and references for categories and subcategories 2.B.1 ammonia production, 2.B.2 nitric acid production, 2.B.4.a caprolactam, 2.B.8.a methanol, 2.B.8.b ethylene, 2.B.8.e acrylonitrile and 2.B.8.f carbon black. For category 2.B.7 soda ash production, the Party reported emission estimates and the AD and EF used in NIR section 4.3.7 (pp.103–104), but did not provide a description of the soda ash production process. For 2021, the Party reported the AD and CO_2 emissions for soda ash production as "NA" in CRF table 2(I).A-H (sheet 1) and explained in NIR section 4.3.7.1 (p.103) that soda ash was not produced in 2021. All other categories and subcategories under category 2.B chemical industry were reported as "NO". During the review, the Party clarified that it will include a description of the soda ash production process in the NIR of the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not provide in its NIR a description of the soda ash production process for category 2.B.7.
I.4	2.B.1 Ammonia production – CO_2 (I.6, 2021) (I.7, 2019) (I.8, 2017) (I.10, 2016) (I.10, 2015) Transparency	(b) Provide in the NIR a description of the production process, EFs and AD used.	(b) Resolved. The Party reported in NIR section 4.3.1.1 (pp.95–96) the description of the ammonia production process. The EFs were reported in NIR section 4.3.1.2 (p.97), while the AD, expressed as consumption of natural gas for ammonia production, were reported in NIR table 4.12 (p.98).
I.5	2.B.1 Ammonia production – CO_2	Improve the methodological description in the NIR by clarifying the types of fuel used in the	Resolved. The Party reported in NIR section 4.3.1.2 (p.97) that it used a tier 2 approach and applied equations 3.2 and 3.3 of the 2006 IPCC Guidelines (vol. 3, chap. 3, p.3.13) for estimating CO_2 emissions from ammonia production. In NIR section 4.3.1.1 (p.95), the Party

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	(I.8, 2021) (I.23, 2019) Transparency	production of ammonia (if only natural gas) and the two equations used, including the values of the parameters applied, to estimate CO_2 emissions (equations 3.2 and 3.3 of the 2006 IPCC Guidelines).	reported that only natural gas is used as fuel in ammonia production. In addition, the Party reported the consumption of natural gas for ammonia production for the whole time series in CRF table 2(I).A-H (sheet 1) except for 2021, for which the AD were reported as confidential. The carbon content and carbon oxidation factors used for the CO_2 emission estimates were provided in NIR section 4.3.1.2 (p.97).
I.6	2.B.1 Ammonia production – CO_2 (I.9, 2021) (I.23, 2019) Transparency	Provide in the NIR (table 4.8) the total fuel requirement of the natural gas used for the production of ammonia.	Resolved. The Party reported in NIR table 4.12 (p.98) the values of the total fuel requirement of the natural gas used for ammonia production for 1990–2020 (in m^3/t ammonia produced). For 2021, the total fuel requirement of natural gas was reported as confidential.
I.7	2.B.2 Nitric acid production – N_2O (I.10, 2021) (I.11, 2019) (I.19, 2017) Consistency	Ensure the time-series consistency of emission estimates by applying the same data source for the entire time series, or, if this is not possible, apply a splicing technique from the 2006 IPCC Guidelines to ensure the consistency of the time series.	Resolved. The Party reported in NIR section 4.3.2.1 (p.100) that N_2O emissions from nitric acid production for 1990–2016 were estimated using the surrogate method as the splicing technique to ensure the consistency of the emission estimates, applying equation 5.2 from the 2006 IPCC Guidelines (vol. 1, chap. 5, p.5.10). The proxy parameter (amount of N fertilizer produced) used for the surrogate method was reported in NIR table 4.13 (p.100). The ERT noted that the Party applied the surrogate method correctly.
I.8	2.C.1 Iron and steel production – CO_2 (I.12, 2021) (I.15, 2019) (I.21, 2017) Transparency	Describe more clearly the origin of the carbon-containing materials used for direct reduction iron and cast iron used in steel-making processes in the NIR (e.g. whether the inputs are imported).	Not resolved. The Party continued to report in NIR section 4.4 (p.111) that the metal industry in Belarus uses imported feedstock and scrap metal from national manufacturing activities, without providing information on the origin of the carbon-containing materials used for category 2.C.1 iron and steel production or explaining why emissions from direct reduction iron and cast iron production were not estimated. During the review, the Party clarified that the imported feedstock mainly comes from the Russian Federation, including hot briquetted iron, and that there is no direct reduction iron production in the country. The Party further clarified that pig iron is not produced directly from iron ore but only moulded from secondary materials, resulting in CO emissions only. The ERT considers that the recommendation has not yet been addressed because the Party did not clarify in the NIR that direct reduction iron is not produced in the country and that cast iron is not actually produced, but rather moulded from secondary materials.
I.9	2.D Non-energy products from fuels and solvent use – CO_2, CH_4 and N_2O (I.14, 2021) (I.17, 2019) (I.11, 2017) (I.13, 2016) (I.13, 2015) Completeness	Collect relevant available AD and estimate emissions for all subcategories under category 2.D for the complete time series for which the 2006 IPCC Guidelines provide estimation methods.	Addressing. The Party reported CO_2 emissions for category 2.D.2 paraffin wax use for 1990–2021 and reported CH_4 and N_2O emissions as "NE" for these years, and reported in NIR section 4.5.1 (p.116) that it is planning to collect data and estimate CO_2 emissions for lubricants. In NIR section 4.5.3 (p.120) the Party reported that NMVOC emissions from use of paints and solvents, and from degreasing and dry cleaning with solvents were not estimated owing to a lack of relevant AD for category 2.D.3 other. During the review, the Party informed the ERT that no time frame has been established for collecting data on lubricants, paints and solvents, and degreasing and dry cleaning with solvents for the complete time series, or on paraffin wax production and the related imports and exports for 1990–1997. The ERT considers that the recommendation has not yet been fully addressed because the Party did not collect relevant AD and estimate emissions for all categories and subcategories under category 2.D.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
I.10	2.E Electronics industry – HFCs, PFCs, SF$_6$ and NF$_3$ (I.15, 2021) (I.18, 2019) (I.25, 2017) Completeness	Either estimate emissions from the electronics industry, or, if this is not possible, apply the correct notation key "NE", and provide a reason in the NIR and CRF table 9 why the emissions cannot be estimated.	Resolved. The Party reported in NIR section 4.6.1.1 (p.124) that only semiconductors are produced in Belarus. The Party reported emissions of HFCs, PFCs, SF$_6$ and NF$_3$ in CRF tables 2(I) (sheet 2), 2(II) and 2(II).B-H (sheet 1) for 1995–2021. According to NIR section 4.6.1.2 (p.125) the tier 1 method from the 2019 Refinement to the 2006 IPCC Guidelines was used to estimate emissions for category 2.E.1 integrated circuit or semiconductor. The ERT noted that the Party correctly reported the AD and HFC, PFC, SF$_6$ and NF$_3$ emission estimates as "NO" for categories 2.E.2 thin-film transistor flat panel display, 2.E.3 photovoltaics, 2.E.4 heat transfer fluid and 2.E.5 other in CRF table 2(II).B-H (sheet 1) and the emission estimates for these categories as "NO" in CRF tables 2(I) (sheet 2) and 2(II) (see ID#s I.18–I.20 in table 5).
I.11	2.F Product uses as substitutes for ozone-depleting substances – HFCs, PFCs, SF$_6$ and NF$_3$ (I.16, 2021) (I.19, 2019) (I.4, 2017) (I.6, 2016) (I.6, 2015) (55, 2013) (60, 2012) Completeness	Obtain AD and report emission estimates for all gases.	Addressing. The ERT noted that the Party made improvements for this category in its 2023 inventory submission; however, it also noted that there were still some gaps in the emissions reported: (1) for subcategory 2.F.1.b domestic refrigeration, HFC-134a emissions were reported for all relevant stages of the equipment life cycle, as described in the NIR (pp.131–133); (2) for subcategories 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration, HFC (HFC-23, HFC-32, HFC-125, HFC-134a and HFC-143a) emissions were reported for stocks, but not for manufacturing and disposal; (3) for subcategories 2.F.1.e mobile air-conditioning and 2.F.1.f stationary air-conditioning, some AD (e.g. the amount of HFCs in different types of equipment) were collected according to the information reported in the NIR (p.122), although no emissions from these two subcategories were reported in CRF table 2(II).B-H (sheet 2); (4) an assessment of the AD was carried out for categories 2.F.3 fire protection and 2.F.4 aerosols, as outlined in the NIR (p.148), but the related emissions were not reported in CRF tables 2(I) (sheet 2) and 2(II).B-H (sheet 2); and (5) no AD were collected or relevant emissions estimated for categories 2.F.2 foam blowing agents and 2.F.5 solvents. During the review, the Party indicated that additional studies are needed to enable it to estimate emissions for categories 2.F.2, 2.F.3, 2.F.4 and 2.F.5. Therefore, the ERT considers that this broad issue has not been fully addressed as a large share of the relevant emissions were not estimated for the categories and subcategories under category 2.F product uses as substitutes for ozone-depleting substances.
I.12	2.F.4 Aerosols – HFCs and PFCs (I.17, 2021) (I.26, 2019) Transparency	Report the correct notation key, "NE", for HFC and PFC emissions in CRF table 2(I) (sheet 2) and include the necessary explanation in CRF table 9.	Addressing. The Party reported "NE" in the relevant cells (i.e. for HFC-134a) in CRF tables 2(I) (sheet 2) and 2(II).B-H (sheet 2), but no explanations were included in CRF table 9. During the review, the Party explained that preliminary data on the use of metered dose inhalers containing HFCs have been collected, which indicate that only HFC-134a is used. The ERT considers that the recommendation has not yet been fully addressed because the Party did not provide explanations for reporting HFC-134a emissions as "NE" for category 2.F.4 aerosols in CRF table 9.
I.13	2.G.1 Electrical equipment – SF$_6$ (I.18, 2021) (I.21, 2019) (I.26, 2017) Completeness	Increase efforts to include emissions from installation and disposal of electrical equipment in the next inventory submission.	Not resolved. The Party reported in NIR section 4.8.1.2 (p.150) that a tier 1 approach was used for estimating SF$_6$ emissions from electrical equipment in operation, and that emissions from the installation and disposal of such equipment were not estimated. Emissions from manufacturing electrical equipment were reported as "NO" as such manufacturing does not occur in Belarus, while emissions from disposal were reported as "NE" in CRF table 2(II).B-H

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
			(sheet 2). During the review, the Party clarified that there are currently no plans for collecting additional data for this category. The ERT noted that the tier 1 approach for estimating SF_6 and PFC emissions from electrical equipment provided in the 2006 IPCC Guidelines (vol. 3, chap. 8, p.8.8) allows for the exclusion of installation emissions if (1) installation emissions are not expected to occur (i.e. for closed-pressure equipment); or (2) installation emissions are included in the EF for emissions from manufacturing or use. The ERT also noted that default lifetimes are above 35 years according to tables 8.2–8.4 of the 2006 IPCC Guidelines (vol. 3, chap. 8, pp.8.15–8.16), hence disposal emissions might not yet have occurred in Belarus. The ERT considers that the recommendation has not yet been addressed because the Party did not include SF_6 emission estimates for installation and disposal of electrical equipment containing SF_6 in the relevant CRF tables and in the NIR, or provide documented information indicating that such emissions do not occur in the country.
I.14	2.G.2 SF_6 and PFCs from other product use – SF_6 and PFCs (I.19, 2021) (I.25, 2019) Completeness	Estimate SF_6 and PFC emissions for this category. While this is not possible, report "NE" for SF_6 and PFC emissions under category 2.G.2 and include in CRF table 9 the necessary explanation and provide in the NIR a section explaining the current status of this source in the country and the reasons for not estimating the emissions.	Addressing. The Party reported SF_6 and PFC emissions under category 2.G.2 SF_6 and PFCs from other product use as "NE" in CRF table 2(II).B-H (sheet 2), and included notes in the corresponding cells explaining that there are no available data. The same explanation was also included in NIR section 4.8.2 (p.142). The Party did not include explanations in CRF table 9 for reporting this category as "NE". During the review, the Party clarified that there are currently no plans for estimating emissions for this category. The ERT considers that the recommendation has not yet been fully addressed because the Party did not estimate SF_6 and PFC emissions for category 2.G.2 and did not provide an explanation in CRF table 9 for reporting these emissions as "NE".
Agriculture			
A.1	3. General (agriculture) – CH_4 and N_2O (A.1, 2021) (A.5, 2019) (A.10, 2017) (A.11, 2016) (A.11, 2015) Accuracy	Estimate the average annual population of growing animals that are alive for less than a year using national data on their life cycle and equation 10.1 of the 2006 IPCC Guidelines (vol. 4, chap. 10).	Resolved. The Party provided in the NIR (pp.162–165) information on the methodology and coefficients used to estimate the average annual population of growing animals alive for less than one year. For example, in NIR table 5.4 (pp.163–164), the populations of cattle and swine and the associated coefficients used to calculate the average annual population were provided. The methodology used by the Party is consistent with equation 10.1 of the 2006 IPCC Guidelines (vol. 4, chap. 10, p.10.8).
A.2	3.A Enteric fermentation – CH_4 (A.3, 2021) (A.32, 2019) Accuracy	Collect data to calculate a more accurate estimate of GE for dairy and non-dairy cattle, taking into account animal productivity, diet quality and management circumstances and the changes in the husbandry sector throughout the time series (i.e. weight, average weight gain, mature weight, average number of hours worked per day, feeding situation, mean winter temperature, average	Addressing. The Party provided updated AD on the percentage of pregnant cows in NIR table 5.9 (pp.169–170) and data on the average weight gain and average weight of the fattening stock in NIR table 5.7 (p.167). The Party also provided in the NIR (p.168) the average fat content value used of 3.8 per cent. The Party further reported that as dairy and non-dairy cattle are not used for work, the work parameter was reported as "NO" in the table with additional information for CRF table 3.A (sheet 2). The ERT noted that the Party did not collect data for certain GE parameters such as feed digestibility and diet despite the Party reporting in its NIR (p.168) that the sector has undergone changes since 1990. The Party noted in the NIR (p.174) that subject to the availability of resources, additional parameters such as feed digestibility and livestock diet will be studied and included in future inventory submissions. During the review, the Party confirmed that data on the percentage of pregnant cows and on the average weight of

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		daily milk production, fat content, percentage of females that give birth in a year and feed digestibility), representing, at least, the current and 1990 characteristics of the animals and interpolating for the other years of the time series.	the fattening stock were updated in the 2023 inventory submission, resulting in recalculations of the estimates of GE across the time series. The Party also informed the ERT that it is already taking steps to update the feed quality and feed digestibility values for a future inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not collect updated data on diet quality or feed digestibility, taking into account management circumstances and the changes in the husbandry sector, to improve the accuracy of the estimates of GE for dairy and non-dairy cattle.
A.3	3.B Manure management – CH_4 and N_2O (A.5, 2021) (A.13, 2019) (A.16, 2017) (A.17, 2016) (A.17, 2015) Accuracy	Make efforts to collect data about the allocation fractions of non-dairy cattle and swine manure per liquid system with and without natural crust cover and revise the estimations of CH_4 and N_2O for this category. A well-documented expert judgment or survey results may be used as a data source for manure allocation per liquid system.	Resolved. The Party collected data on the allocation fractions of non-dairy cattle and swine manure per liquid system and revised the CH_4 and N_2O emission estimates. In the NIR (pp.179–180), the Party provided additional details on the expert judgment on the national MMS, which was based on oral consultations with specialists from the Scientific and Practical Centre of the National Academy of Sciences of Belarus for Animal Husbandry, and indicated that all assessments of manure allocation by MMS were agreed between specialists from the Republican Scientific Research Unitary Enterprise "BEL NIC Ecology" and from the Scientific and Practical Centre of the National Academy of Sciences of Belarus for Animal Husbandry. The Party also indicated in the NIR (p.180) that 100 per cent of liquid manure storage systems for cattle and swine are covered with a natural crust since the manure collected is stored and not regularly washed until it is applied to fields.
A.4	3.B Manure management – CH_4 (A.6, 2021) (A.17, 2019) (A.31, 2017) Transparency	Provide detailed information in the NIR on the methodology applied to derive the fractions of manure in the different management systems that are consistent with the values reported in CRF table 3.B(a) (sheet 2).	Resolved. The Party provided information in the NIR (p.180) on the methodology applied to derive the fractions of manure in the different management systems. As described in the NIR (p.180), experts carried out an assessment of the distribution of manure by storage system type and use. This assessment was also reviewed and agreed upon by the Scientific and Practical Centre of the National Academy of Sciences of Belarus for Animal Husbandry. The Party provided information and annual data on MMS by livestock category for the entire time series in the additional information table for CRF table 3.B(a) (sheet 2) that are consistent with the information reported in the NIR.
A.5	3.B Manure management – N_2O (A.8, 2021) (A.22, 2019) (A.34, 2017) Accuracy	Apply values for the fraction of volatile N in line with the 2006 IPCC Guidelines and ensure that the values in the NIR are consistent with the information provided in CRF table 3.B(b) for category 3.B.5 indirect N_2O emissions.	Resolved. The Party applied values for the fraction of volatile N used in its calculations in line with the 2006 IPCC Guidelines. The Party revised NIR tables 5.22 and 5.30 (pp.186 and 193 respectively) to ensure consistency with the information provided in tables 10.22–10.23 of the 2006 IPCC Guidelines (vol. 4, chap. 10, pp.10.65 and 10.67 respectively). To improve consistency with the information reported in CRF table 3.B(b) for category 3.B.5 indirect N_2O emissions, the Party also revised NIR table 5.22 by reporting dairy cattle liquid systems as "NO".
A.6	3.B Manure management – N_2O (A.9, 2021) (A.23, 2019) (A.34, 2017) Transparency	Justify the choice of values for $Frac_{GASM}$ (category 3.B.5) and $Frac_{LOSS}$ (category 3.D.b.1) from the tables provided in the 2006 IPCC Guidelines with references.	Resolved. The Party reported values for $Frac_{LOSS}$ in NIR table 5.30 (p.193) in accordance with the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10.23, p.10.67) and reported a value of 0.20 for $Frac_{GASM}$ in the additional information table for CRF table 3.D in accordance with the 2006 IPCC Guidelines (vol. 4, chap. 11, table 11.3, p.11.24). However, the ERT noted that the value of 0.1 for $Frac_{GASM}$ reported in NIR table 5.27 (p.186) is different from the value reported in CRF table 3.D. During the review, the Party clarified that there was a transcription error associated with the reported value of $Frac_{GASM}$ and by mistake the value of $Frac_{GASF}$ was not

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			included in NIR table 5.27. The Party further clarified that the correct values of Frac$_{GASM}$ and Frac$_{GASF}$ were used for calculating the emission estimates and provided a calculation spreadsheet which confirmed the use of the correct fractions. The ERT considers that the recommendation has been resolved, but also considers it necessary to correct the inconsistencies identified in the reported values of Frac$_{GASM}$ between the NIR and CRF tables.
A.7	3.B Manure management – N$_2$O (A.10, 2021) (A.24, 2019) (A.34, 2017) Convention reporting adherence	Check the consistency between NIR tables 5.18 and 5.25 and the CRF tables.	Resolved. The Party revised NIR table 5.22 (p.186) to report dairy cattle liquid systems as "NO", thereby improving consistency between the NIR and CRF table 3.B(b). NIR table 5.22 shows the tables that required updating from the 2021 inventory submission.
A.8	3.B Manure management – CH$_4$ (A.11, 2021) (A.33, 2019) Accuracy	Either apply the default value (0.08) provided in the 2006 IPCC Guidelines and recalculate CH$_4$ emissions or provide a justification of the national parameter for ash content in manure, based on peer-reviewed published literature, measurements or expert judgment, in accordance with the 2006 IPCC Guidelines.	Resolved. As reported in the NIR (p.178), the Party applied the default value of ash content in manure for cattle (0.08) provided in the 2006 IPCC Guidelines (vol. 4, chap. 10, equation 10.24, p.10.42). The Party also reported in NIR table 5.17 (p.179) that the ash content value used for pigs was 0.15. In the NIR (p.406), the Party noted that since the 2006 IPCC Guidelines do not provide default ash content values for pigs, to ensure consistency in the calculation of VS for pigs, a country-specific approach was used based on national technology standards for livestock. The ERT noted that this approach is consistent with equation 10.24 of the 2006 IPCC Guidelines. The Party reported on the recalculation of the CH$_4$ emission estimates for manure management in its NIR (p.188) in addition to a comparison of relevant parameters (e.g. VS) with those of other reporting Parties in NIR table 5.24 (p.187). The ERT concluded that the calculated VS values are within the range of those reported by other Parties with similar circumstances.
A.9	3.B Manure management – CH$_4$ and N$_2$O (A.12, 2021) (A.34, 2019) Accuracy	Collect data to estimate a more accurate share of MMS reflecting the changes and improvements in the animal husbandry sector, representing at least the current and 1990 distribution of MMS and interpolating for the other years of the time series.	Resolved. In the NIR (p.180), the Party explained that it used expert judgment based on consultations with members of the Scientific and Practical Centre of the National Academy of Sciences of Belarus for Animal Husbandry to estimate more accurately the share of MMS in the animal husbandry sector across the time series (see ID# A.4 above). The Party also provided information and data on annual MMS by livestock category across the time series in the additional information table for CRF table 3.B(a) (sheet 2).
A.10	3.B.1 Cattle – CH$_4$ (A.13, 2021) (A.35, 2019) Accuracy	Estimate average daily VS excretion for the entire time series so that the VS value reflects the variations that have occurred in dairy cattle in the inventory period, for example, by using equation 10.24 of the 2006 IPCC Guidelines (vol. 4, chap. 10) in combination with the GE estimated for enteric fermentation.	Resolved. As noted in the NIR (p.178), the Party used equation 10.24 of the 2006 IPCC Guidelines (vol. 4, chap. 10, p.10.42) to calculate daily VS excretion for the entire time series. The Party also updated the data on VS excretion in NIR table 5.17 (p.179) to reflect the use of equation 10.24.

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A.11	3.B.5 Indirect N$_2$O emissions – N$_2$O (A.20, 2021) Accuracy	Report consistently the values used in the estimations, including the EF for atmospheric deposition, in CRF table 3.B(b) and the NIR, correct the EFs applied for calculating the indirect N volatilized as NH$_3$ and NO$_X$ for this category across the time series using the default values included in the 2006 IPCC Guidelines (vol. 4, chap. 10, table 10.22), and document the recalculations in the NIR.	Resolved. The Party provided explanations in the NIR (pp.186, 189 and 190; and table 4.4, p.408) on the use of EFs for calculating indirect N$_2$O emissions for category 3.B.5 indirect N$_2$O emissions, including the EFs for N loss from MMS due to volatilization and for atmospheric deposition (0.01 kg N$_2$O–N). The Party used the default values included in tables 10.22 and 11.3 of the 2006 IPCC Guidelines (vol. 4, chaps. 10–11, pp.10.65 and 11.24 respectively) for the estimates of indirect N$_2$O emissions from manure management across the time series. The Party also ensured consistency between the total indirect N$_2$O emissions reported in NIR table 5.13 (pp.174–175) and in CRF table 3.B(b).
A.12	3.F Field burning of agricultural residues – CH$_4$ and N$_2$O (A.21, 2021) Completeness	Investigate (e.g. by means of an expert survey and desk review) possible emissions from field burning of residues and report the findings in the NIR together with the relevant emissions. If it can be demonstrated that there is no burning of agricultural residues in the country for the entire time series, continue reporting emissions as "NO" and provide supporting documentation in the NIR. If the emissions are found to be insignificant, report emissions and AD as "NE" in CRF table 3.F and provide justification in the NIR in accordance with the UNFCCC Annex I inventory reporting guidelines (para. 37(b)).	Addressing. The Party reported in its NIR (p.154) that the burning of agricultural residues is prohibited by law in the country. However, it did not report on any investigations conducted (e.g. an expert survey or desk review) on the possible occurrence of emissions from field burning of agricultural residues in Belarus. During the review, the Party clarified that crop residues are incorporated into the soils and used as organic additives for enhancing soil fertility, rather than burned. Therefore, the Party reported field burning of agricultural residues as "NO" in CRF table 3.F. However, as noted by the Party, data from FAO indicate that burning of agricultural residues occurs in the country. Acknowledging this, the Party conducted a significance threshold analysis, as reported in the NIR (p.154), showing that any potential emissions that might occur according to the FAO data would be insignificant. The Party estimated the likely level of emissions for 2019 for this activity as amounting to 44 kt CO$_2$ eq, which is below the threshold of significance for Belarus calculated for 2021 (45.99 kt CO$_2$ eq). In its comments on the provisional main findings of the ERT, the Party indicated that it is of the view that it provided in the NIR clear evidence that burning of crop residues does not occur in the country owing to strong regulation of such activity through several national laws, and that the method used by FAO to collect data on burning of agricultural residues is unknown. The ERT considers that the recommendation has not been fully addressed because the Party did not report on efforts undertaken to investigate (e.g. by means of an expert survey or desk review) whether field burning of agricultural residues actually occurs in the country and did not provide documented justification in the NIR to support the reporting of the related emissions as "NO" in CRF table 3.F or provide estimates of the corresponding emissions.
A.13	3.H Urea application – CO$_2$ (A.17, 2021) (A.31, 2019) (A.38, 2017) Transparency	Provide in the NIR an explanation of the trend in the N input from application of inorganic fertilizers to cropland and grassland.	Resolved. The Party explained in its NIR (p.190) that the trend in the N input from the application of inorganic fertilizers to cropland and grassland depends on changes in the overall economic situation in the country. The ERT considers that the recommendation has been fully addressed.

LULUCF

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
L.1	4. General (LULUCF) – CO$_2$, CH$_4$ and N$_2$O	Provide in the NIR and the CRF tables estimates of carbon stock	Addressing. The Party reported "NE" for carbon stock changes in categories 4.A.2 land converted to forest land, 4.B.2 land converted to cropland (except for wetlands converted to

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	(L.1, 2021) (L.1, 2019) (L.1, 2017) (L.1, 2016) (L.1, 2015) (67, 2013) (83, 2012) Completeness	changes and emissions for all mandatory categories.	cropland), 4.C.2 land converted to grassland, 4.D wetlands (except for organic soils under wetlands remaining wetlands) and 4.F other land. The Party reported "NE" in CRF table 4(I) for N_2O emissions from inorganic N fertilizers under settlements remaining settlements; in CRF table 4(II) for CO_2, CH_4 and N_2O emissions from all sources, except for CO_2 and N_2O emissions from drained organic soils under forest land; in CRF table 4(III) for N_2O emissions from all categories, except for wetlands remaining wetlands; and in CRF table 4(V) for CO_2, CH_4 and N_2O emissions from wildfires under wetlands remaining wetlands and land converted to wetlands. The Party has made progress in using the correct notation keys for reporting missing data in the CRF tables and by providing since the 2021 submission carbon stock changes for category 4.E settlements. In the NIR, the Party reported:

For the ERT assessment and rationale column, continuing:

(a) For category 4.A.2: that no carbon stock changes were estimated for this category, and that work is under way to collect the necessary information for the calculations (section 6.4.2.2, p.243);

(b) For category 4.B.2: descriptions for CO_2 emission estimates from organic soils converted to cropland only (reported under 4.B.2.3 wetlands converted to cropland) (section 6.4.2.5, p.249);

(c) For category 4.C.2: the assumptions applied for reporting "NA" or "IE" for carbon stock changes under category 4.C.1 grassland remaining grassland, but no separate information for category 4.C.2 land converted to grassland (section 6.6.2, p.251);

(d) For category 4.D: only information on the calculation of carbon stock changes and emission estimates for subcategory 4.D.1.1 peat extraction remaining peat extraction (section 6.7.2, pp.252–253);

(e) For category 4.F: that there is insufficient national data to estimate the GHG balance for the category (section 6.9.2, p.258).

During the review, the Party clarified that it has collected AD for estimating GHG emissions and removals for land categories converted to grassland back to 1990 and plans to provide the related estimates of GHG emissions and removals for the 2024 inventory submission. The Party also clarified that it is making efforts to collect data back to 1970 (or appropriate surrogate data) in order to estimate soil carbon stock changes using the 20-year transition period. The Party explained that carbon stock changes for category 4.B cropland will be estimated after the GHG emissions and removals for category 4.C grassland have been estimated. The ERT considers that the recommendation has not yet been addressed because the Party did not provide estimates of emissions and removals for all mandatory categories in the CRF tables and the relevant methodological descriptions in the NIR.

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L.2	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.2, 2021) (L.2, 2019) (L.1, 2017) (L.1, 2016) (L.1, 2015)	Provide a consistent uncertainty analysis for each estimated mandatory category.	Addressing. The Party reported in NIR section 6.3 (p.217) that the uncertainty of statistical information is within the range of 15–25 per cent, and that since the EFs are derived mainly from IPCC guidance documents, their uncertainty is based on the information provided in those documents, which in most cases is within 50 per cent. The Party also reported uncertainty values for the parameters used for the estimates in the respective category sections of the NIR,

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	(67, 2013) (83, 2012) Convention reporting adherence		namely for categories 4.A forest land (section 6.4.3, p.244), 4.B cropland (section 6.5.3, p.249), 4.D wetlands (section 6.7.3, p.254), 4.E settlements (section 6.8.3, p.257) and 4.G HWP (section 6.10.3, p.266). AD uncertainties were reported within the range of 15–25 per cent for categories 4.A forest land and 4.G HWP, and as 10 per cent for categories 4.B cropland, 4.D wetlands and 4.E settlements. The ERT noted that the uncertainty was not assessed for category 4.C grassland, as GHG emissions and removals were not estimated for this category, and that the Party did not take the partial reporting of the carbon fluxes in forest land into account in the LULUCF uncertainty analysis, as described in NIR section 6.4.3 (p.244) (see ID# L.7 below). The ERT also noted that no references were included in the NIR for non-IPCC sources of uncertainty values or for the chapters of the 2006 IPCC Guidelines that were used for selecting uncertainty values, even though the 2006 IPCC Guidelines (vol. 1, chap. 3, p.3.40) state that documentation should be sufficient to support the estimates and enable duplication of the uncertainty estimates, including the source of any data or models used as the basis for estimating uncertainty. During the review, the Party clarified that it used the default uncertainty values provided in the 2006 IPCC Guidelines for the AD for the LULUCF categories (this is inferred to be the 10 per cent value for total land area provided in the 2006 IPCC Guidelines (vol. 4, chap. 3, table 3.7, p.3.20)) and that it will address the inconsistencies in its reporting in the next inventory submission. The Party further clarified that an uncertainty assessment for category 4.C grassland will be included in the 2024 inventory submission, once the planned estimation of related emissions and removals for this category has been performed. The ERT considers that the recommendation has not yet been fully addressed because the Party did not provide an uncertainty analysis for each estimated mandatory category and did not provide sufficient information in the NIR to demonstrate that the reported uncertainty analysis for the LULUCF sector is consistent with each estimated mandatory category.
L.3	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.3, 2021) (L.3, 2019) (L.1, 2017) (L.1, 2016) (L.1, 2015) (67, 2013) (83, 2012) Convention reporting adherence	Enhance the QA/QC procedures that are used for the LULUCF sector and, as a minimum, undertake an internal technical review to ensure consistency between the NIR and the CRF tables.	Resolved. The Party briefly described the QA/QC procedures for the LULUCF sector in NIR section 6.3 (pp.217–218). The Party described the tier 1 QC checks carried out for forest land in NIR section 6.4.4 (pp.244–245) and provided brief information on the checks for other land-use categories in NIR sections 6.5.4, 6.6.4, 6.7.4, 6.8.4, 6.9.4 and 6.10.4 (pp.249, 250, 251, 254, 257, 258 and 266 respectively). The ERT noted that the Party enhanced the QA/QC procedures for the LULUCF sector aimed at ensuring the correct use of notation keys and consistency between the NIR and the CRF tables.
L.4	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.4, 2021) (L.4, 2019) (L.9, 2017) Transparency	Provide detailed information in the planned improvements section (6.1.7) of the NIR with accompanying time frames related to estimating all missing categories using at least a tier 1 approach, providing an uncertainty analysis and implementing QA/QC procedures for each estimated category, or at least conduct an	Resolved. The Party reported in NIR sections 6.4.6, 6.5.6, 6.6.6, 6.7.6, 6.8.6, 6.9.6 and 6.10.6 (pp.245, 250, 252, 254, 258, 259 and 267 respectively) planned or implemented improvements with accompanying time frames related to estimating missing categories, providing an uncertainty analysis and implementing QA/QC procedures for each estimated category. During the review, the Party clarified that an improvement plan for the LULUCF sector with specific time frames was included in table 4.4 of annex 4 to the NIR (pp.409–416).

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
		internal technical review to ensure consistency between the NIR and the CRF tables.	
L.5	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.5, 2021) (L.5, 2019) (L.10, 2017) Convention reporting adherence	Correct the inconsistency between the information on total forest land area provided in the NIR (table 6.5, p.152) and in CRF table 4.1.	Addressing. The Party reported total forest land area in NIR tables 6.3 and 6.7 (pp.205–206 and 222 respectively) and in CRF table 4.1. The areas reported in the NIR and the CRF table are the same for all years except 1995, for which an area of 8,303.0 kha was reported in NIR tables 6.3 and 6.7, while an area of 8,300.56 kha was reported in CRF table 4.1. During the review, the Party clarified that the correct final total area of forest land for 1995 is 8,300.56 kha, as reported in CRF table 4.1. The Party stated that it will address this inconsistency for the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not correct the inconsistencies in the total forest land area reported for all years of the time series between the NIR and CRF table 4.1.
L.6	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.17, 2021) Accuracy	Estimate the carbon fluxes for the total national territory.	Not resolved. The Party did not estimate the carbon stock changes for the whole national territory, as only part of the country's forest fund was included in the national GHG inventory, as described in the NIR (pp.221–222), with the included areas listed in NIR table 6.7 (p.222). During the review, the Party indicated that additional research is required to address this recommendation.
L.7	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.17, 2021) Convention reporting adherence	Conduct the LULUCF uncertainty analysis, taking into consideration the fact that only part of the country's forest fund is included in the national inventory, until the reporting of carbon fluxes for the total territory of the country is available.	Not resolved. The Party did not take the partial reporting of the carbon fluxes in forest land into account in the LULUCF uncertainty analysis, as described in NIR section 6.4.3 (p.244). During the review, the Party indicated that additional research is required to address this recommendation.
L.8	4.A.2 Land converted to forest land – CO_2 and N_2O (L.9, 2021) (L.9, 2019) (L.6, 2017) (L.6, 2016) (L.6, 2015) (72, 2013) (89, 2012) Completeness	Improve the completeness and transparency of the reporting on land converted to forest land in the CRF tables and the NIR, and ensure consistency of the information reported in the NIR with that reported in the CRF tables.	Not resolved. The carbon stock changes and net CO_2 emissions and removals from land converted to forest land were reported as "NE" for all land-use changes and all pools in CRF table 4.A, with the exception of carbon stock changes in mineral soils under subcategory 4.A.2.3 wetlands converted to forest land, which were reported as "NO". The Party briefly stated in NIR section 6.4.2.2 (p.243) that no estimates of carbon stock changes were made for this category and that work is ongoing to collect the necessary information for the calculations. During the review, the Party stated that this issue will be addressed in the 2024 inventory submission. The ERT considers that the recommendation has not yet been addressed because the Party did not report emissions and removals for all mandatory subcategories under category 4.A.2 land converted to forest land or consistent information in the NIR and the CRF tables for this category.
L.9	4.A.2.3 Wetlands converted to forest land – CO_2 (L.10, 2021) (L.15, 2019)	Apply the correct notation key, "NO", for area of mineral soils for wetlands converted to forest land in CRF table 4.A.	Resolved. The Party reported the area of mineral soils for wetlands converted to forest land as "NO" in CRF table 4.A.

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	Convention reporting adherence		
L.10	4.B.1 Cropland remaining cropland – CO_2 (L.11, 2021) (L.16, 2019) Accuracy	Either apply the EF provided in the 2006 IPCC Guidelines (vol. 4, chap. 5, table 5.6, p.5.19) or justify the use of the EF provided in the IPCC good practice guidance for LULUCF as country-specific in the next NIR. If a recalculation is performed, provide in the NIR relevant information on the recalculation in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party applied the default EF (5.0 t C/ha) for boreal/cool temperate organic soils from the 2006 IPCC Guidelines (vol. 4, chap. 5, table 5.6, p.5.19). This change in EF was first made for the 2022 inventory submission and relevant information on the related recalculations was provided in the NIR of that submission.
L.11	4.C.1 Grassland remaining grassland – CO_2 (L.12, 2021) (L.17, 2019) Transparency	Provide in the NIR a correct description of the method used under "changes of the carbon content in dead biomass".	Resolved. The Party reported in NIR section 6.6.2 (p.251) under the heading "Change in carbon content in dead biomass" that, according to the tier 1 method provided in the 2006 IPCC Guidelines, the net change in carbon stock in dead biomass in grassland is assumed to be zero. The Party used the tier 1 method and correctly reported the carbon stock change in dead organic matter as "NA" in CRF table 4.C. The ERT considers that the recommendation has been resolved because the Party provided in the NIR a correct description of the method used and correctly applied the tier 1 method assumption.
L.12	4.D.1 Wetlands remaining wetlands – N_2O (L.14, 2021) (L.18, 2019) Accuracy	Report N_2O emissions in accordance with the 2006 IPCC Guidelines and ensure the consistent reporting of N_2O emissions between the NIR and CRF tables and report the notation key "NE" in CRF table 4(II) under subcategory 4.D.D.1 (peat extraction lands – drained organic soils), together with a justification for not including the emissions in the NIR and CRF table 9.	Addressing. The Party reported N_2O emissions as "NA" in CRF table 4(II) under subcategory 4.D.D.1 peat extraction lands (drained organic soils) and explained in NIR section 6.7.2.2 (p.254) that emissions for this subcategory are considered to be negligible for nutrient-poor organic soils, in line with the tier 1 guidance in table 7.6 of the 2006 IPCC Guidelines (vol. 4, chap. 7, p.7.16). The ERT noted that reporting emissions that are negligible as "NE" is appropriate in this case and, therefore, the Party should include an explanation in the NIR and in CRF table 9 for not estimating the emissions. In addition, the ERT noted that the Party still included information in NIR section 6.7.2.1 and table 6.31 (pp.252–253) that refers to calculating N_2O emissions from peat extraction lands (drained organic soils) using the IPCC good practice guidance for LULUCF. During the review, the Party referred the ERT to NIR section 6.7.2 (pp.252–254) to show its progress in addressing the recommendation. The ERT considers that the recommendation has not yet been fully addressed because the Party did not report N_2O emissions under category 4.D.1 peat extraction lands (drained organic soils) as "NE" in CRF table 4(II) together with an explanation in CRF table 9, and did not remove the contradictory text and information on the estimation of N_2O emissions from NIR section 6.7.2.1 and table 6.31.
L.13	4.G HWP – CO_2 (L.18, 2021) Comparability	Ensure the complete and consistent reporting of the AD on the production, import and export of	Addressing. The Party included consistent AD on the production and export of HWP for 1990–2021 in CRF table 4.G (sheet 2) and NIR tables 6.38–6.39 (pp.263–265), consistently with approach B. However, AD on the production and export of HWP for 1960–1989 were not

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		HWP in CRF table 4.G (sheet 2) and the NIR.	provided in CRF table 4.G (sheet 2) and were only partially provided in the NIR. AD on the import of HWP are not required under approach B. During the review, the Party provided AD for 1961–1989 on the production and export of HWP for CRF table 4.G (sheet 2) and stated that these data will be included in the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not include complete AD on the production and export of HWP in CRF table 4.G (sheet 2) and only partially included these AD in the NIR.
L.14	4.G HWP – CO_2 (L.19, 2021) Convention reporting adherence	Revise the values for net CO_2 emissions and removals from HWP in the NIR (table 6.40) and ensure the consistency of that reporting with the values given in CRF table 4.G (sheet 1).	Resolved. The reported annual change in stock in HWP products in use for domestic consumption from HWP produced from domestic harvest and the net CO_2 emissions from domestic harvest are consistent between NIR table 6.40 (pp.265–266) and CRF table 4.G (sheet 1).

Waste

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
W.1	5.A Solid waste disposal – CH_4 (W.5, 2021) (W.5, 2019) (W.6, 2017) (W.8, 2016) (W.8, 2015) Transparency	Identify the country-specific management practices of CH_4 recovery or flaring and report accordingly in the next GHG inventory submission the respective amounts of CH_4 recovered for energy recovery purposes or flared; alternatively, use the notation key "NO" in the absence of such practices in the country, or justify the use of the notation key "NE".	Addressing. The Party did not provide information in NIR section 7.2 (pp.272–275) on the country-specific management practices for CH_4 recovery or flaring. The Party reported CH_4 recovery and flaring as "NE" under categories 5.A.1 managed waste disposal sites, 5.A.2 unmanaged waste disposal sites and 5.A.3 uncategorized waste disposal sites for 2012–2021 and as "NO" for 1990–2011, without providing justification for its use of "NE" in NIR section 7.2 or in CRF table 9. The ERT noted, however, that the Party included a note in the relevant cells of CRF table 5.A explaining that it reported "NE" owing to the insignificance of emissions from flaring and insignificance of the recovered volume of CH_4. The Party reported in table 4.4 of annex 4 to the NIR (pp.416–418) information on the status of previous recommendations on this issue and explained that, for category 5.A solid waste disposal, the total volume of CH_4 recovered for energy recovery purposes is estimated to be 0.675 kt CO_2 eq for 2021, equal to 0.00074 per cent of national total emissions. The ERT noted that this estimate falls below the significance threshold for Belarus for 2021 (45.99 kt CO_2 eq) estimated in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and, therefore, the reporting of "NE" is justified. During the review, the Party clarified that private biogas plants have been installed at some MSW landfills since 2012 and that the reporting of CH_4 recovery in CRF table 5.A has therefore been revised to "NO" for 1990–2011 and to "NE" for 2012–2021 since the 2021 inventory submission. The ERT considers that, while the Party seems to have appropriately reported CH_4 recovery for category 5.A as "NO" and "NE" and that both would be justified by the information provided by the Party during the review, the recommendation has not yet been fully addressed because the Party did not identify the country-specific management practices for CH_4 recovery or flaring in NIR section 7.2 and did not report the amounts of CH_4 recovered for energy recovery purposes or flared or did not provide an explanation in CRF table 9 for reporting as "NE" the amounts of CH_4 recovered for energy recovery purposes or flared (or for the resulting CO_2 emissions) in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
W.2	5.A Solid waste disposal – CH$_4$ (W.6, 2021) (W.6, 2019) (W.7, 2017) (W.9, 2016) (W.9, 2015) Accuracy	Collect and elaborate updated information on MSW historical composition using all available reference sources from national studies, surveys and results of relevant projects.	Addressing. The Party did not provide information in NIR section 7.2 (pp.272–275) on steps taken to collect and elaborate updated information on the historical composition of MSW; however, it reported in table 4.4 of annex 4 to the NIR (p.418) that data on the historical composition of MSW for 1985 have been collected but that data prior to 1985 will be extremely difficult to collect. During the review, the Party provided a full time series (1950–2021) of data on MSW composition that were used for the 2023 inventory submission. The ERT noted that statistical data were only available for six individual years (1999, 2004, 2007, 2008, 2010 and 2016) from six different data sources (e.g. the Ministry of Municipal Services and the Ministry of Natural Resources and Environmental Protection). For all other years between 1950 and 2021, the composition of MSW was either interpolated (i.e. for 2000–2003, 2009, 2011–2015) or kept constant (i.e. for 1950–1999, 2004–2006 and 2016–2021). The ERT noted that this has led to significant inter-annual changes in MSW composition from 2009 to 2010 (the proportion of textile waste decreased by 54 per cent and food waste increased by 11 per cent) and from 2010 to 2011 (the proportion of inert waste increased by 23 per cent and paper waste decreased by 15 per cent). In addition, the Party did not provide clear explanations for the procedures applied to generate MSW composition data for the years indicated above, for which statistical data were not available. The Party further acknowledged that the data for 1985 were not taken into account in the 2023 inventory submission and informed the ERT that the interpolation method would be applied for the years between 1985 and 1999 in the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because although updated historical data for 1985 were collected this information was not used to update the historical MSW composition used for estimating emissions in the 2023 inventory submission and no information was provided in the NIR on steps taken to collect and elaborate updated information on the historical composition of MSW.
W.3	5.A Solid waste disposal – CH$_4$ (W.7, 2021) (W.7, 2019) (W.8, 2017) (W.9, 2016) (W.9, 2015) Accuracy	Explore the possibility of initiating sample measurement of MSW composition in specialized laboratories, ensuring a better reflection of the real historical composition of the MSW disposed of in SWDS, including information on the disposal of sludge originated from wastewater treatment and industrial solid waste, and enabling the use of higher-tier methods for estimating CH$_4$ emissions from solid waste disposal following the guidance available in the 2006 IPCC Guidelines.	Not resolved. The Party did not provide information in the NIR on steps taken to explore the possibility of obtaining sample measurements of MSW composition; however, it reported in NIR section 7.2.6 (p.275) a planned improvement to use national data on the morphological composition of waste in future inventory submissions. The ERT noted that the recommendation to initiate sample measurement of MSW composition in specialized laboratories would only inform current and future compositions of MSW disposed of at SWDS. However, these measurements could also inform expert judgment on changes to historical MSW composition. During the review, the Party stated that information on the historical composition of MSW for 1985 have been collected and that the interpolation method would be applied in the next inventory submission to better reflect the real historical composition of MSW disposed of in SWDS. The ERT considers that the recommendation has not yet been addressed because although the Party collected historical information that could be used to update the composition of MSW from 1985 backward, it did not provide information on the steps taken to explore the possibility of initiating sample measurement of MSW composition in specialized laboratories, including information on the disposal of sludge originating from wastewater treatment and industrial solid waste.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
W.4	5.A Solid waste disposal – CH$_4$ (W.19, 2021) Transparency	Transparently describe in the NIR the data sources for the volumes of generated MSW, industrial waste and sewage sludge and their application by year, as well as the background assumptions used and the procedures applied for years for which statistical data are not available. Explain in the NIR how time-series consistency is ensured where multiple data sources are used for the reported period.	Not resolved. The Party reported in NIR section 7.2.2 (pp.272–274) a brief description of the AD used in the calculations for MSW, industrial waste and sewage sludge, including the data sources and underlying assumptions used. During the review, the Party provided an Excel file ("MSW IW time series") showing the AD for MSW and industrial waste generation and disposal for 1950–2021 and an additional Excel file ("SWD sludge") showing the quantity of sludge generated and disposed of at SWDS for 1950–2021, including information on the several data sources used for different periods of the time series and the procedures applied for years for which statistical data are not available. The ERT considers that insufficient information was provided in the NIR to justify the assumptions applied for the AD used in the calculations across the time series, as well as on how time-series consistency was maintained, for example information clarifying why interpolation was applied for certain years while a constant value was applied for others (see ID#s W.5, W.6 and W.7 below). The ERT considers that the recommendation has not yet been addressed because the Party did not include in the NIR a transparent description of the data sources for the volume of generated MSW, industrial waste and sewage sludge for 1990–2021, or an explanation of the procedures applied for years for which statistical data are not available, or information on how time-series consistency was ensured.
W.5	5.A Solid waste disposal – CH$_4$ (W.20, 2021) Consistency	Revise and, if necessary, update the MSW generation AD to ensure consistency across the entire time series and revise the CH$_4$ emission estimates accordingly, providing explanatory information on any recalculations performed in the NIR.	Not resolved. The Party did not include in NIR section 7.2.2 (pp.272–274) transparent and complete information on the methodology used to collect MSW generation data, on any revisions or updates of the MSW generation AD across the time series and the subsequent revision of the CH$_4$ emission estimates, or on how time-series consistency was ensured. The Party stated in the NIR (pp.272–273) that MSW generation AD prior to 1990 were extrapolated using the population as a proxy variable; however, no description was provided of the data sources used for the years after 1990 or of the procedures applied for years where statistical data are not available. During the review, the Party provided an Excel file containing historical MSW generation data for 1990–2021, including information on the several data sources used, assumptions and gap-filling methods applied for different periods of the time series (see ID# W.4 above). The ERT noted significant inter-annual changes for 1995–1996 (16.7 per cent), 2003–2004 (14.1 per cent) and 2004–2005 (–20.5 per cent). During the review, the Party clarified that the inter-annual changes for 1995–1996 and 2003–2004 were caused by a decrease in purchasing power owing to the difficult financial situation in the country at that time and a decrease in the population, but did not provide an explanation for the inter-annual change between 2004 and 2005. The Party also did not provide a clear explanation during the review on how time-series consistency was maintained despite the use of multiple data sources, stating that updated MSW generation AD are not available. Further, the Party did not include in NIR section 7.2.6 (p.275) information on planned improvements aimed at avoiding potential time-series inconsistencies in the AD for this category. The ERT considers that the recommendation has not yet been addressed because the Party did not revise and update the MSW generation AD and continued to report MSW generation AD from multiple data sources without providing a sufficient explanation of how time-series consistency was maintained, and did not report on plans to investigate and avoid potential inconsistencies.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
W.6	5.A Solid waste disposal – CH$_4$ (W.21, 2021) Transparency	Provide in the NIR detailed information on the AD (e.g. in tabular format) and its sources and any assumptions used to calculate industrial waste disposed of at landfills and demonstrate how time-series consistency is ensured. If AD on disposed industrial waste are updated for the entire time series to ensure the consistency of data across the time series, report any recalculations made in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.	Addressing. The Party provided in NIR section 7.2.2 (pp.273–274) a general description of the AD for industrial waste disposed of at landfills, including information on the various data sources used and the assumptions applied for different periods of the time series when calculating the quantity of industrial waste disposed of at landfills. In NIR table 7.2 (pp.273–274), the Party provided information on degradable organic carbon values and AD for generation and disposal of industrial waste for 2021. The ERT noted that the Party did not provide in the NIR detailed AD (e.g. in tabular format) for the whole time series and did not include sufficient information on how time-series consistency was ensured considering the use of multiple data sources. During the review, the Party provided an Excel file with the full time series of AD for industrial waste generated and landfilled, together with the data sources and assumptions used (see ID# W.4 above). The Party informed the ERT that the full time series of AD for industrial waste will be included in the NIR of the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because the Party did not include in the NIR detailed information on the AD used and the procedures applied to ensure time-series consistency.
W.7	5.A Solid waste disposal – CH$_4$ (W.22, 2021) Accuracy	Improve emission estimates for this category using updated AD calculated on the basis of more accurate values for the shares of disposed industrial waste and sewage sludge across the time series, or justify the application of the constant value of 2.7 per cent of generated industrial waste disposed of at SWDS across the time series.	Addressing. The Party reported in NIR section 7.2.2 (p.273) that of the total industrial waste generated in the country, the share of industrial waste disposed of at SWDS was 2.7 per cent, which was applied for the entire time series (based on information available for 2019 only), without providing sufficient justification for this assumption. During the review, the Party provided a data file ("MSW IW time series") showing the AD used for industrial waste disposed of at SWDS for the entire time series, specifying the sources of data used and showing the relevant calculations of CH$_4$ emissions based on the assumptions reported in the NIR (see ID# W.4 above). The ERT confirmed that from the total industrial waste generated in the country a value of 2.7 per cent for the industrial waste disposed of at SWDS was used for 1950–2019, but noted that a value of 2.4 per cent was used for 2020–2021. The Party also reported in NIR section 7.2.2 (p.274) that of the total sewage sludge generated in the country, the share of sewage sludge disposed of at SWDS was 1.93 per cent for the entire time series, without providing sufficient justification for this assumption. During the review, the Party provided a data file ("SWD sludge") showing the share of sewage sludge disposed of at SWDS across the entire time series (see ID# W.4 above). The ERT confirmed that a value of 1.93 per cent of sewage sludge disposed of at SWDS was used for 2018–2021, but noted that a value of 2.2 per cent was used for 2017 and a value of 2.7 per cent was used for 1950–2016. During the review, the Party clarified that the AD for industrial waste and sewage sludge provided in the data files are the correct values and stated that the descriptions provided in the NIR will be updated in the next inventory submission. The ERT considers that the recommendation has not yet been fully addressed because although the Party updated the historical AD using more accurate values for the shares of industrial waste and sewage sludge disposed of at SWDS across the time series, it did not include in the NIR sufficient information to justify the values assumed and applied across the times series.
W.8	5.A Solid waste disposal – CH$_4$	Make an accurate estimate of emissions for this key category and	Not resolved. The Party reported the AD and CH$_4$ emissions for categories 5.A.1 managed waste disposal sites and 5.A.2 unmanaged waste disposal sites as "IE" in CRF table 5.A and

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
	(W.23, 2021) Accuracy	separately estimate and report emissions from managed and unmanaged waste disposal sites in accordance with the 2006 IPCC Guidelines (vol. 5, chap. 3.2) by, for example, using survey findings or expert judgment documented in accordance with the 2006 IPCC Guidelines (vol. 1, chap. 2, annexes).	estimated and reported aggregated CH_4 emissions from all SWDS under category 5.A.3 uncategorized waste disposal sites using the default MCF of 0.6 corresponding to uncategorized SWDS provided in the 2006 IPCC Guidelines (vol. 5, chap. 3, table 3.1, p.3.14). The ERT noted that the application of this MCF and other parameters may not result in an accurate estimate of emissions for this key category as it likely does not reflect the specific circumstances across the various landfill types in Belarus. The Party stated in NIR section 7.2 (p.272) that there are currently no disaggregated data on the amount of waste disposed of in managed or unmanaged SWDS for the entire time series; therefore, all SWDS are considered to be uncategorized. The Party also reported in NIR section 7.2.6 (p.275) a planned improvement to collect updated AD on MSW disposal disaggregated by landfill type for the entire time series over the next few years in order to ensure the use of accurate MCF values. During the review, the Party confirmed that it will make efforts to estimate CH_4 emissions separately for managed and unmanaged waste disposal sites in the next inventory submission. The ERT considers that the recommendation has not yet been addressed because the Party did not accurately estimate emissions from managed and unmanaged SWDS separately, applying the appropriate SWDS categorization, MCFs, oxidation factors and other parameters in accordance with the 2006 IPCC Guidelines (vol. 5, chap. 3, pp.3.11, 3.14 and 3.15).
W.9	5.B Biological treatment of solid waste – CH_4 and N_2O (W.13, 2021) (W.19, 2019) Completeness	Either implement the planned improvement of clarifying the amount of waste subject to mechanical-biological treatment as well as the technologies used, or report "NE" in CRF table 5.B together with a justification for the exclusion in terms of the likely level of the emissions (using approximate AD and default IPCC EFs to derive a likely level of emissions for the respective category) in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party reported in CRF table 5.B the amount of MSW anaerobically digested at biogas facilities and the associated CH_4 and N_2O emissions as "NE" for 2011–2021 and as "NO" for 1990–2010 under subcategory 5.B.2.a municipal solid waste under category 5.B.2 anaerobic digestion at biogas facilities, providing a justification in NIR section 7.3.2 (p.276) for the likely negligible level of emissions by estimating the likely annual level of emissions at the Brest Waste Processing Plant in operation since 2011, reported as 2.5 kt CO_2 eq. During the review, the Party provided the calculations used to derive the likely level of emissions based on the plant's mechanical-biological treatment capacity (100 kt MSW/year on a wet weight basis) and the IPCC default CH_4 and N_2O EFs for anaerobic digestion at biogas facilities. However, the ERT noted that incorrect EFs were applied in these calculations. According to the 2006 IPCC Guidelines (vol. 5, chap. 4, table 4.1, p.4.6), N_2O emissions from anaerobic digestion at biogas facilities are negligible and the default CH_4 EF is 0.8 g CH_4/kg waste treated on a wet weight basis. On the basis of these parameters, the ERT calculated that the likely level of emissions is approximately 2 kt CO_2 eq. The ERT acknowledges that the revised approximate emissions are below the significance threshold for Belarus calculated for 2021 (45.99 kt CO_2 eq) estimated in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines (see ID# W.21 in table 5). During the review, the Party stated that it will apply the correct EFs and recalculate and report in the NIR the likely level of emissions from the Brest Waste Processing Plant in the next inventory submission. The ERT considers that the recommendation has been addressed even though the Party applied incorrect EFs for the calculations to derive the likely level of the insignificant emissions. The ERT also considers it necessary to include in the NIR information on data and parameters used for calculating this level of emissions.

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
W.10	5.B.1 Composting – CH$_4$ and N$_2$O (W.24, 2021) Transparency	Include in the NIR a separate section on composting, including information on the progress of the plans to build composting sites under the "National Strategy for the Management of Municipal Solid Waste and Secondary Material Resources in the Republic of Belarus", and provide information justifying the use of the notation key "NO" in CRF table 5.B.	Addressing. NIR section 7.3 (pp.275–276) covers information on category 5.B biological treatment of solid waste but does not include a separate section on composting. In NIR section 7.3.1 (pp.275–276), the Party reported that for 2021 it has achieved high composting rates for the organic fraction of MSW (235.41 kt), as part of the implementation of the tasks set out in the State programme "Comfortable Housing and Favourable Environment". In CRF table 5.B, the Party reported CH$_4$ emissions from composting of MSW for 2021 but continued to report the emissions as "NO" for 1990–2020, without providing a justification for doing so in the NIR. During the review, the Party clarified that the first composting sites were created in 2021 under the State programme "Comfortable Housing and Favourable Environment", and that no organized composting took place in Belarus before 2021. The ERT considers that the recommendation has not yet been fully addressed because the Party did not include in its NIR a separate section on composting and a transparent description of the evolution of organized composting facilities over time in Belarus, including information on the progress of building composting sites.
W.11	5.C Incineration and open burning of waste – CO$_2$, CH$_4$ and N$_2$O (W.25, 2021) Accuracy	Collect AD on the amount of industrial and medical waste incinerated for the whole time series to recalculate the CO$_2$, CH$_4$ and N$_2$O emissions across the time series for the category. If this is not possible, further justify the assumption and constant values used or apply one of the techniques for resolving data gaps from the 2006 IPCC Guidelines (vol. 1, chap. 5, section 5.3).	Resolved. The Party reported in CRF table 5.C the AD and CO$_2$, CH$_4$ and N$_2$O emission estimates for incineration of industrial and medical waste for the complete time series and indicated in table 4.4 of annex 4 to the NIR (p.424) that it collected updated AD on the amount of industrial and medical waste incinerated for 2001−2021. However, contrary to the description provided in the NIR, the ERT confirmed that, as reported in CRF table 5.C, the Party collected updated AD available for 1990, 1995, 1999 and 2000−2021 and interpolated historical values to obtain AD for 1991–1994 and 1996–1998 in accordance with the interpolation techniques for resolving data gaps from the 2006 IPCC Guidelines (vol. 1, chap. 5, p.5.11). The ERT considers that the recommendation has been fully addressed because available updated AD were collected, and the interpolation method applied to resolve the remaining data gaps is deemed reasonable by the ERT.
W.12	5.C Incineration and open burning of waste – CO$_2$, CH$_4$ and N$_2$O (W.26, 2021) Comparability	Ensure consistent reporting of information on incineration and open burning between the NIR and the CRF tables and reallocate the emissions from incineration of industrial and medical waste (reported under category 5.C.2 in the 2021 submission) to category 5.C.1, separately reporting the waste amounts and emissions for incineration of industrial solid waste, hazardous waste and clinical waste.	Resolved. In accordance with the description provided in NIR section 7.4 (p.277), the Party correctly reported in CRF table 5.C the AD and GHG emissions for incineration of industrial solid waste, which includes hazardous waste, clinical waste and sludge, under subcategory 5.C.1.b.2 other under subcategory 5.C.1.b non-biogenic, which were reported previously under category 5.C.2 open burning of waste in the 2022 inventory submission. The ERT considers that the recommendation has been fully addressed because information on category 5.C incineration and open burning of waste was reported correctly and consistently in the CRF tables and the NIR, and emissions from incineration of industrial solid waste and clinical waste were reported separately and reallocated to category 5.C.1 waste incineration.
W.13	5.C Incineration and open burning of waste – CO$_2$, CH$_4$ and N$_2$O	Include in the NIR information justifying that GHG emissions from	Not resolved. The Party reported in NIR section 7.4.1 (p.277) that there is no open burning of waste in Belarus. However, the Party did not provide any justification for this claim in the NIR. According to the previous review report, the Party clarified that GHG emissions from open

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
	(W.27, 2021) Transparency	open burning of waste do not occur in the country.	burning of waste do not occur in the country because national policies and legislation prohibit the incineration of waste outside specialized facilities in accordance with air quality, environmental protection and fire safety regulations. However, during the review, the Party indicated that it will not provide this justification in future NIRs, stating that this issue was resolved during the previous inventory review and that justification was included in the NIR of the 2022 inventory submission. The ERT considers that this issue is not resolved until the Party explicitly includes in the NIR clear information justifying that GHG emissions from open burning of waste do not occur in the country.
W.14	5.D Wastewater treatment and discharge – CH_4 (W.15, 2021) (W.14, 2019) (W.5, 2017) (W.7, 2016) (W.7. 2015) (81, 2013) (99, 2012) Transparency	Provide more information on wastewater treatment systems and discharge pathways in the NIR to justify that there are no emissions and use the notation key "NO" instead of "NE".	Resolved. The Party provided a description of the domestic and industrial wastewater treatment systems and discharge pathways in Belarus in NIR sections 7.5.1.1, 7.5.1.2, 7.5.2.1 and 7.5.2.2 (pp.278–279, 279–280, 282–283 and 283 respectively). The Party reported in CRF table 5.D CH_4 emissions for the whole time series (1990–2021) for categories 5.D.1 domestic wastewater and 5.D.2 industrial wastewater. In CRF table 5.D, the Party reported category 5.D.3 other as "NO" for the whole time series (1990–2021). The ERT considers that this recommendation has been fully addressed.
W.15	5.D Wastewater treatment and discharge – CH_4 (W.16, 2021) (W.15, 2019) (W.10, 2017) (W.11, 2016) (W.11, 2015) Transparency	Explore and document the existence of CH_4 for energy recovery and flaring at wastewater treatment plants and, depending on the results obtained, report accordingly in the NIR and CRF tables the CH_4 recovered and/or flared, or use the correct notation key for the domestic and industrial wastewater category.	Addressing. In CRF table 5.D, the Party reported category 5.D.1 domestic wastewater as "NO" for 1990–2016 and as "NE" for 2017–2021 for both the amount of CH_4 flared and the amount of CH_4 used for energy recovery. However, the Party did not document in the CRF tables or in the NIR that no CH_4 flaring or energy recovery took place before 2017 and did not provide or document the rationale for reporting "NE" for 2017 onward. During the review, the Party clarified that, according to the renewable energy sources cadastre, two CH_4 extraction and incineration facilities for wastewater treatment systems are registered in Belarus, with a total capacity of 1.27 MW. The Party also clarified that the reporting of "NE" for 2017 onward corresponds to the start of operation of these facilities. The ERT notes that, although the Party provided some general information on CH_4 flaring practices at wastewater treatment plants in the two CH_4 extraction and incineration facilities in table 4.4 of annex 4 to the NIR (p.420), this information should be documented in greater detail in NIR section 7.5.1 (pp.278–282), including by clarifying and documenting whether CH_4 recovery or flaring, or both, occurred in the country. Further, the ERT considers that it is possible to roughly estimate the amount of CH_4 flared or eventually used for energy recovery on the basis of the 1.27 MW installed capacity at the two CH_4 extraction and incineration facilities. For category 5.D.2 industrial wastewater, the Party reported in CRF table 5.D the amount of CH_4 flared for 1990–2021 as "NO" and the amount of CH_4 used for energy recovery as "NO" for 1990–2009 and as "NE" for 2010–2021, stating in NIR section 7.5.2.1 (p.283) that there is no CH_4 recovery during industrial wastewater treatment in Belarus. However, the Party also reported in NIR section 7.5.2.2 (p.283) that CH_4 recovery was not estimated owing to a lack of information on projects for collecting and disposing of CH_4 at industrial wastewater treatment facilities. During the review, the Party clarified that the reporting of "NO" for the amount of CH_4 used for energy recovery for 1990–2009 is incorrect and that it will change the reporting to "NE" for the entire time series in the next inventory submission. The ERT acknowledges the progress made by the Party in investigating CH_4 flaring and recovery practices in Belarus, but considers that the

ID#	Issue classification[a, b]	Recommendation from previous review report	ERT assessment and rationale
			recommendation has not yet been fully addressed because the Party did not provide sufficiently transparent and consistent information on CH_4 for energy recovery and flaring at wastewater treatment plants and did not use the notation keys correctly for reporting CH_4 used for energy recovery and eventually for flaring.
W.16	5.D Wastewater treatment and discharge – N_2O (W.17, 2021) (W.16, 2019) (W.11, 2017) (W.12, 2016) (W.12, 2015) Accuracy	Investigate the wastewater treatment practices in the country and provide in the NIR a transparent description of the activities occurring under this category, together with estimates of direct and/or indirect N_2O emissions, in accordance with the methodological approaches available in the 2006 IPCC Guidelines, using the adjusted protein consumption data provided by Belstat during the review.	Addressing. The Party reported indirect N_2O emissions for category 5.D.1 domestic wastewater in CRF table 5.D for the whole time series (1990–2021). However, it did not report information on related wastewater treatment practices in the country and a transparent description of the activities occurring under this category in the NIR. During the review, the Party provided the Excel file used to calculate indirect N_2O emissions from domestic wastewater. The ERT noted that these calculations were conducted in accordance with the methodological approaches and default parameters available in the 2006 IPCC Guidelines (vol. 5, chap. 6, pp.6.24–6.27), using official annual protein consumption AD provided by Belstat. However, the Party did not clarify in the NIR subsection "Nitrous oxide emissions from domestic wastewater" (pp.280–281) that these indirect N_2O emissions correspond to nitrification and denitrification in rivers and estuaries. Further, in the table with additional information for CRF table 5.D, the Party reported $F_{NON-CON}$ and $F_{IND-COM}$ as "NE" and did not provide the values for these parameters in the NIR subsection "Nitrous oxide emissions from domestic wastewater". The Party stated during the review that it will report the values for these two parameters in the table with additional information for CRF table 5.D in the next inventory submission. The ERT also noted that the Party did not estimate direct N_2O emissions from controlled nitrification and denitrification processes in centralized aerobic wastewater treatment plants and did not provide an explanation in the NIR as to whether these activities occur in Belarus. The ERT considers that the recommendation has not been fully addressed because the Party did not report in the NIR information on related wastewater treatment practices in the country and a description of the activities occurring under this category. In addition, there was a lack of transparency regarding the methods used to estimate indirect N_2O emissions from nitrification and denitrification in rivers and estuaries, and the Party did not sufficiently explore the potential occurrence (or lack) of direct N_2O emissions from controlled nitrification and denitrification processes in centralized aerobic wastewater treatment plants in Belarus.

[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.

[b] The report on the review of the 2022 inventory submission of Belarus was not available at the time of this review. Therefore, the recommendations reflected in this table are taken from the 2021 inventory review report. For the same reason, 2022, 2020, 2018 and 2014 are excluded from the list of review years in which issues could have been identified.

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

8.   In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three or more successive reviews, including the review of the 2023 inventory submission of Belarus, and had not been addressed by the Party by the time of publication of this review report.

Table 4
Issues identified in three or more successive reviews and not addressed by Belarus

ID#	Previous recommendation for issue	Number of successive reviews issue not addressed[a]
General		
G.1	Report in the NIR on the status of implementation of each planned improvement and on the time frames for implementation.	3 (2019–2023)
G.2	Include in the NIR more information to explain the methodologies and procedures used in the calculations, a description of the data-collection process and more data tables to present the AD and EFs that have been used, as well as background information on all AD used in the inventory, specifically for the energy and industrial processes sectors.	7 (2012–2023)
G.4	Ensure the correct use of the notation keys (including "NA") in the CRF tables in line with decision 24/CP.19, annex I, paragraphs 37, 50(f) and 53.	4 (2017–2023)
G.5	Provide justification for the use of notation keys, particularly "NE" and "IE", in the NIR and in CRF table 9.	4 (2017–2023)
G.9	Report in the NIR complete information on the recalculations relating to previously submitted inventory data, in particular in relation to recalculations made in response to the review process and include a discussion on the impact of the recalculations on the trend in emissions.	5 (2015/2016–2023)
G.10	Provide more extensive information on the reasons for observed trends in emissions across the time series at the sectoral level and for the most important categories within these sectors.	5 (2015/2016–2023)
G.11	Include an explanation for the observed changes in the reported uncertainty estimates between inventory submissions in the NIR; use only well-documented country-specific values for parameters in the uncertainty analysis; and report how the uncertainty analysis is used to prioritize inventory improvements.	7 (2012–2023)
G.12	Perform and report on the uncertainty assessment by including information on the quantitative estimates of the uncertainty of the data used for all source and sink categories using the 2006 IPCC Guidelines.	4 (2017–2023)
Energy		
E.2	Use country-specific EFs for key categories.	7 (2012–2023)
E.3	Implement QC procedures to ensure the correct and consistent use of notation keys.	6 (2013–2023)

ID#	Previous recommendation for issue	Number of successive reviews issue not addressed[a]
E.11	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach.	7 (2012–2023)
E.12	Enhance verification procedures to ensure the consistency of information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d).	5 (2015/2016–2023)
E.17	Ensure consistency across CRF tables 1.A(b), 1.A(c) and 1.A(d).	6 (2013–2023)
E.18	Obtain information on the utilization of naphtha, lubricants, coal and coal products as feedstocks and for non-energy purposes; use this information to improve the accuracy of the emission estimates; and provide detailed relevant explanations in the NIR to improve transparency.	7 (2012–2023)
E.19	Recalculate the excluded carbon from NEU of fuels for crude oil in accordance with the 2006 IPCC Guidelines using data from the national fuel and energy balance on crude oil used for non-energy purposes and as feedstock for non-fuel products.	4 (2017–2023)
E.20	Provide information in the NIR on how jet kerosene is allocated between domestic and international flights for 2000–2011.	7 (2012–2023)
E.22	Provide documented information on the country-specific NCVs used in the emission calculations, with the aim of demonstrating the accuracy of those values.	5 (2015/2016–2023)
E.23	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels.	7 (2012–2023)
E.27	Explain the methodology used for developing the country-specific parameters (NCVs, carbon contents and EFs) used for the inventory in the energy sector, and provide a justification that the country-specific parameters are more suitable for the national circumstances.	4 (2017–2023)
E.30	Report disaggregated emission data by subcategory under manufacturing industries and construction.	7 (2012–2023)
E.33	(c) Estimate and report CO_2 emissions from biomass use in the corresponding categories; (d) Use the correct notation key for CH_4 and N_2O emissions from biomass in road transportation and railways if this type of fuel is not used in these categories.	5 (2015/2016–2023)
E.46	Include in the NIR a section to describe the AD, EFs and method applied to calculate emissions under this subcategory.	3 (2019–2023)
E.47	Collect more information from Belstat to identify whether the fuels reported in the energy balance as "distribution losses" are combusted or released as fugitive emissions and document in the NIR the result of this research. If some of the fuels are not combusted – particularly for natural gas, which might not be combusted – revise the AD and recalculate emissions under subcategory 1.A.5.a by excluding the amount of fuels not combusted and reallocating it under the correct fugitive emissions category (oil or natural gas).	3 (2019–2023)
E.48	Report the correct notation key, "IE", for AD and emissions for this category in CRF table 1.A(a) (sheet 4) and provide explanatory information in CRF table 9 accordingly.	3 (2019–2023)

ID#	Previous recommendation for issue	Number of successive reviews issue not addressed[a]
E.50	Develop QC procedures for the oil and natural gas category in order to ensure the accuracy of estimates, time-series consistency, the correct use of notation keys and the transparency of the information provided in the NIR.	6 (2013–2023)
E.51	Use methods and EFs in accordance with the 2006 IPCC Guidelines, and provide in the NIR detailed and documented information on AD and EFs used in the estimation of all gases for all subcategories under fugitive emissions from oil and natural gas.	5 (2015/2016–2023)
E.52	Provide in the NIR detailed and documented information on methods, AD and EFs used in the estimates, in particular when changes in methodologies, sources of information and assumptions are made in relation to recalculations, as well as information on the rationale for these recalculations and their impact on total emissions.	5 (2015/2016–2023)
E.54	Ensure the correctness of the units used for the AD and EFs for all categories under 1.B.2 oil and natural gas and other emissions from energy production and provide a detailed explanation for the choice of EFs.	4 (2017–2023)
E.56	Include in the AD under subcategory 1.B.2.b.4 gas transmission and storage all gas transmitted by the pipeline system to industrial consumers or natural gas distribution systems, including both produced and imported natural gas, as well as emissions from natural gas storage systems, calculated separately.	4 (2017–2023)
E.57	Provide detailed information in the NIR on the methodology used for the emission estimates, and justifications for the completeness of the AD.	4 (2017–2023)
IPPU		
I.3	Ensure that the information in the NIR on emission estimates for this category is fully transparent in accordance with the requirements of the UNFCCC Annex I inventory reporting guidelines and include information on EFs used, references and descriptions of the production processes for the reported subcategories under the category chemical industry.	5 (2015/2016–2023)
I.8	Describe more clearly the origin of the carbon-containing materials used for direct reduction iron and cast iron used in steel-making processes in the NIR (e.g. whether the inputs are imported).	4 (2017–2023)
I.9	Collect relevant available AD and estimate emissions for all subcategories under category 2.D for the complete time series for which the 2006 IPCC Guidelines provide estimation methods.	5 (2015/2016–2023)
I.11	Obtain AD and report emission estimates for all gases.	7 (2012–2023)
I.12	Report the correct notation key, "NE", for HFC and PFC emissions in CRF table 2(I) (sheet 2) and include the necessary explanation in CRF table 9.	3 (2019–2023)
I.13	Increase efforts to include emissions from installation and disposal of electrical equipment in the next inventory submission.	4 (2017–2023)
I.14	Estimate SF_6 and PFC emissions for this category. While this is not possible, report "NE" for SF_6 and PFC emissions under category 2.G.2 and include in CRF table 9 the necessary explanation and provide in the NIR a section explaining the current status of this source in the country and the reasons for not estimating the emissions.	3 (2019–2023)
Agriculture		

ID#	Previous recommendation for issue	Number of successive reviews issue not addressed[a]
A.2	Collect data to calculate a more accurate estimate of GE for dairy and non-dairy cattle, taking into account animal productivity, diet quality and management circumstances and the changes in the husbandry sector throughout the time series (i.e. weight, average weight gain, mature weight, average number of hours worked per day, feeding situation, mean winter temperature, average daily milk production, fat content, percentage of females that give birth in a year and feed digestibility), representing, at least, the current and 1990 characteristics of the animals and interpolating for the other years of the time series.	3 (2019–2023)
LULUCF		
L.1	Provide in the NIR and the CRF tables estimates of carbon stock changes and emissions for all mandatory categories.	7 (2012–2023)
L.2	Provide a consistent uncertainty analysis for each estimated mandatory category.	7 (2012–2023)
L.5	Correct the inconsistency between the information on total forest land area provided in the NIR (table 6.5, p.152) and in CRF table 4.1.	7 (2012–2023)
L.8	Improve the completeness and transparency of the reporting on land converted to forest land in the CRF tables and the NIR, and ensure consistency of the information reported in the NIR with that reported in the CRF tables.	7 (2012–2023)
L.12	Report N_2O emissions in accordance with the 2006 IPCC Guidelines and ensure the consistent reporting of N_2O emissions between the NIR and CRF tables and report the notation key "NE" in CRF table 4(II) under subcategory 4.D.D.1 peat extraction lands – drained organic soils, together with a justification for not including the emissions in the NIR and CRF table 9.	3 (2019–2023)
Waste		
W.1	Identify the country-specific management practices of CH_4 recovery or flaring and report accordingly in the next inventory submission the respective amounts of CH_4 recovered for energy recovery purposes or flared; alternatively, use the notation key "NO" in the absence of such practices in the country, or justify the use of the notation key "NE".	5 (2015/2016–2023)
W.2	Collect and elaborate updated information on MSW historical composition using all available reference sources from national studies, surveys and results of relevant projects.	5 (2015/2016–2023)
W.3	Explore the possibility of initiating sample measurement of MSW composition in specialized laboratories, ensuring a better reflection of the real historical composition of the MSW disposed of in SWDS, including information on the disposal of sludge originated from wastewater treatment and industrial solid waste, and enabling the use of higher-tier methods for estimating CH_4 emissions from solid waste disposal following the guidance available in the 2006 IPCC Guidelines.	5 (2015/2016–2023)
W.15	Explore and document the existence of CH_4 for energy recovery and flaring at wastewater treatment plants and, depending on the results obtained, report accordingly in the NIR and CRF tables the CH_4 recovered and/or flared, or use the correct notation key for the domestic and industrial wastewater category.	5 (2015/2016–2023)
W.16	Investigate the wastewater treatment practices in the country and provide in the NIR a transparent description of the activities occurring under this category, together with estimates of direct and/or indirect N_2O emissions, in accordance	5 (2015/2016–2023)

ID#	Previous recommendation for issue	Number of successive reviews issue not addressed[a]
	with the methodological approaches available in the 2006 IPCC Guidelines, using the adjusted protein consumption data provided by Belstat during the review.	

[a] Reports on the reviews of the 2014, 2018, 2020 and 2022 inventory submissions of Belarus have not yet been published. Therefore, 2014, 2018, 2020 and 2022 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 inventory 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 2023 inventory submission

9.   Table 5 presents findings made by the ERT during the individual review of the 2023 inventory submission of Belarus that are additional to those identified in table 3.

Table 5
Additional findings made during the individual review of the 2023 inventory submission of Belarus

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
General			
G.13	Methods	The ERT noted that the Party did not use the recommended methods in accordance with the decision trees in the 2006 IPCC Guidelines for a number of key categories (see ID# G.3 in table 3). This is not in accordance with paragraph 11 of the UNFCCC Annex I inventory reporting guidelines, according to which, for categories that are considered to be key categories in accordance with the 2006 IPCC Guidelines (vol. 1, chap. 4, pp.4.5–4.6), Annex I Parties should make every effort to develop and/or select EFs and collect and select AD in accordance with IPCC good practice. Further, in accordance with paragraph 11 of the UNFCCC Annex I inventory reporting guidelines, for categories that are considered to be key categories, where national circumstances prohibit the use of a recommended method, the Annex I Party shall explain in its annual inventory submission the reason why it was unable to implement a recommended method in accordance with the decision trees in the 2006 IPCC Guidelines. During the review, the Party indicated that some explanations for not implementing higher-tier methods were included in the NIR, owing in most of the cases to unavailability of data and country-specific EFs and parameters and, for example, indicated that it used a tier 2 method for all key categories in the IPPU sector, as well as for CH_4 emissions for categories 3.A enteric fermentation and 3.B manure management.	Not an issue
		The ERT reiterates the encouragement that the Party make every effort, for categories that are considered to be key categories in accordance with paragraph 11 of the UNFCCC Annex I inventory reporting guidelines and the 2006 IPCC Guidelines, to develop and/or select EFs and collect and select AD in accordance with IPCC good practice, and use a recommended method in accordance with the relevant decision trees in the 2006 IPCC Guidelines.	
Energy			

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
E.59	1.A.3.c Railways – solid fuels – CH_4 and N_2O	The Party reported in its NIR (p.58) that the CH_4 and N_2O EFs for subcategory 1.A.3.c railways were sourced from table 3.4.1 of the 2006 IPCC Guidelines (vol. 2, chap. 3, p.3.43) and that the corresponding EFs for sub-bituminous coal from that table were applied to peat briquettes for estimating emissions for this subcategory. The ERT noted that this may not be fully in line with the 2006 IPCC Guidelines (vol. 2, chap. 3, equation 3.4.1, p.3.41), because the EFs by fuel type should match the fuel type consumed. The ERT also noted that the definition of fuel types in the 2006 IPCC Guidelines (vol. 2, chap. 1, table 1.1, pp.1.12–1.16), classify peat in compressed form (briquettes) as peat, because the primary source of peat briquettes is peat. During the review, the Party clarified that the CH_4 and N_2O EFs were selected owing to the lack of solid fuel EFs for railways in the 2006 IPCC Guidelines.

The ERT recommends that the Party source the CH_4 and N_2O EFs for estimating emissions from peat briquettes and other bituminous coal for subcategory 1.A.3.c railways from table 2.4 of the 2006 IPCC Guidelines (vol. 2, chap. 2, pp.2.20–2.21). | Yes. Accuracy |

IPPU

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
I.15	2.A.2 Lime production – CO_2	The ERT noted that CO_2 emissions for category 2.A.2 lime production is a key category (by level without LULUCF) for 1990 according to table 1.3 of annex 1 to the NIR (p.305). CO_2 emissions for category 2.A.2 is also a key category (by trend without LULUCF) for 2021 according to table 1.6 of annex 1 to the NIR (p.326). However, CO_2 emissions for category 2.A.2 were not reported in CRF table 7 as a key category. The ERT also noted that CO_2 emissions for this category were estimated using a tier 1 methodology according to NIR section 4.2.1.2 (p.86). During the review, the Party acknowledged that CO_2 emissions for category 2.A.2 is a key category and stated that it is planning to collect additional data to use a tier 2 methodology for this category.

The ERT recommends that Belarus collect the necessary data to use the tier 2 methodology from the 2006 IPCC Guidelines (vol. 3, chap. 2, pp.2.20–2.21) for this key category and report the corresponding CO_2 emission estimates in its next inventory submission. | Yes. Accuracy |
| I.16 | 2.B.10 Other (chemical industry) – CO_2 | The Party reported in CRF tables 2(I) (sheet 1) and 2(I).A-H (sheet 1) the AD and emissions for hydrogen production as "NE". However, the Party did not provide in CRF table 9 an explanation for reporting "NE" for CO_2 emissions for category 2.B.10 other (hydrogen) or include in the NIR a description of hydrogen production. The ERT noted that although there is no explicit methodology for estimating emissions from hydrogen production in the 2006 IPCC Guidelines, the GHG inventory lead reviewers, at their meeting in 2019, concluded that consistently with the 2006 IPCC Guidelines, the reporting of all CO_2 emissions related to the NEUs of fuels is required, including fuels used for hydrogen production (para. 27(f) of the conclusions and recommendations of the sixteenth meeting of GHG inventory lead reviewers). The ERT also noted that since hydrogen generally comes from a reforming process, the general guidance provided in the 2006 IPCC Guidelines (vol. 3, chap. 3, box 3.8, p.3.58) should be used to estimate CO_2 emissions from hydrogen production. During the review, the Party clarified that there are no available data for hydrogen production for 1990–2021 and that the explanation for reporting "NE" will be included in CRF table 9 in the next inventory submission. The Party further clarified that gasoline fractions or natural gas are used for the reforming process.

The ERT recommends that the Party obtain the necessary AD on amounts of gasoline fractions and natural gas, apply the related NCVs and CO_2 EFs used for combustion emissions, estimate and report CO_2 emissions from | Yes. Completeness |

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		hydrogen production and include a description for category 2.B.10 in the NIR on the method, AD and EFs used for the emission estimates.	
I.17	2.C.1 Iron and steel production – CH$_4$	The ERT noted that Belarus used a CH$_4$ EF of 0.90 kg CH$_4$/t steel for estimating emissions from electric arc furnaces, which is not provided in the 2006 IPCC Guidelines. During the review, the Party clarified that this value is based on the national technical code of common practice "Rules for calculating greenhouse gas emissions in the main sectors of the economy of the Republic of Belarus - TCH 17.09–05–2013 (02120)", where the value is provided without any further references. The ERT also noted that the Party did not provide any further references to a country-specific or equivalent study to justify this value.	Yes. Transparency
		The ERT recommends that Belarus provide in the NIR the source and background information used to calculate the CH$_4$ EF (0.90 kg CH$_4$/t steel) that is used for estimating emissions from electric arc furnaces.	
I.18	2.E.1 Integrated circuit or semiconductor – N$_2$O and PFCs	The Party reported emissions under unspecified mix of PFCs for 1995–2021 in CRF table 2(II).B-H (sheet 1). The Party added a comment to the cell where these emissions are reported in CRF table 2(II).B-H (sheet 1) stating that the unspecified mix consisted of three PFC gases (C$_5$F$_8$, C$_4$F$_8$O and C$_4$F$_6$) and N$_2$O. The same emission estimates for the mix of gases were also reported in NIR table 4.29 (pp.127–128). The ERT noted that only PFCs may be grouped under the unspecified mix of PFCs in CRF table 2(II).B-H (sheet 1) and that N$_2$O emissions from semiconductor manufacturing could be reported under category 2.G other product manufacture and use (i.e. subcategory 2.G.3.b other (N$_2$O from product uses)). During the review, the Party clarified that N$_2$O emissions from semiconductor manufacturing will be subtracted from the unspecified mix of PFCs and reallocated to t category 2.G.3 N$_2$O from product uses, as suggested.	Yes. Comparability
		The ERT recommends that the Party report N$_2$O emissions from semiconductor manufacturing separately from PFC emissions under subcategory 2.G.3.b other (N$_2$O from product uses) in CRF table 2(I).A-H (sheet 2).	
I.19	2.E.1 Integrated circuit or semiconductor – HFCs, PFCs, SF$_6$, NF$_3$ and N$_2$O	In CRF table 2(II).B-H (sheet 1) the Party reported as "NE" the AD for all gases for which emissions were reported for category 2.E.1 integrated circuit or semiconductor in CRF table 2(II). For each instance of "NE" reported in CRF table 2(II).B-H (sheet 1), the Party added a comment stating that it used "tier 1 and data on the surface area of the substrate (silicon) used during the production of the electronic devices". The comment included the amounts (in m^2) for each year of the time series for which emissions were reported. In NIR section 4.6.1.2 (p.125), the Party provided a description of the methodological approach (tier 1 method from the 2019 Refinement to the 2006 IPCC Guidelines), data sources and assumptions used to estimate emissions for category 2.E.1. During the review, the Party confirmed that it used a tier 1 method in accordance with the 2019 Refinement to the 2006 IPCC Guidelines to estimate emissions for category 2.E.1 and used the annual manufacturing capacity of semiconductor production (in units of substrate surface area, m^2) as AD instead of consumption of F-gases. The ERT noted that CRF table 2(II).B-H (sheet 1) does not allow the reporting of the AD for category 2.E.1 in any form other than as consumption of F-gases (in t) in semiconductor manufacturing processes.	Yes. Transparency
		The ERT recommends that the Party change the reporting of the AD to "NA", correct the description of the AD, use the documentation box of CRF table 2(II).B-H (sheet 1) to explain the AD used for the emission estimates for category 2.E.1 integrated circuit or semiconductor and include a reference to the relevant section of the NIR where information is provided on the methodology, EFs, AD and assumptions used.	

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
I.20	2.E.1 Integrated circuit or semiconductor – HFCs, PFCs, SF$_6$, NF$_3$ and N$_2$O	The Party reported in NIR section 4.6.1.2 (p.125) that the tier 1 method from the 2019 Refinement to the 2006 IPCC Guidelines was used to estimate HFC, PFC, SF$_6$, NF$_3$ and N$_2$O emissions for category 2.E.1 integrated circuit or semiconductor. The ERT noted that the 2006 IPCC Guidelines contain methodologies for estimating emissions from electronics industry (vol. 3, chap. 6, pp.6.10–6.16). The ERT also noted that the Party did not provide in the NIR a justification for using the method from the 2019 Refinement to the 2006 IPCC Guidelines when there is methodological guidance available for this category in the 2006 IPCC Guidelines. According to paragraph 10 of the UNFCCC Annex I inventory reporting guidelines, Parties may use national methodologies which they consider better able to reflect their national situation, provided that these methodologies are compatible with the 2006 IPCC Guidelines and are well-documented and scientifically based. This requirement also applies to methods provided in newly recognized international literature. During the review, the Party indicated that it used a tier 1 method from the 2019 Refinement to the 2006 IPCC Guidelines to estimate emissions for category 2.E.1 and that the annual manufacturing capacity of semiconductor production (in units of substrate surface area, m^2) was used as AD.

The ERT recommends that the Party provide in the NIR a justification for using the tier 1 method provided in the 2019 Refinement to the 2006 IPCC Guidelines instead of the methodology provided in the 2006 IPCC Guidelines for estimating emissions for category 2.E.1. | Yes. Transparency |
| I.21 | 2.F.1.a Commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration – HFCs | For subcategories 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration, only HFC emissions from stocks were reported in CRF table 2(II).B-H (sheet 2), while manufacturing emissions were reported as "NO" and disposal emissions as "NE". During the review, the Party explained that emissions from disposal were not reported for these subcategories owing to a lack of reliable data on the annual volumes of decommissioned equipment. The ERT noted that for subcategories 2.F.1.a and 2.F.1.c in particular, many of the refrigeration systems are assembled on-site with an initial fill of refrigerants, which is likely to produce emissions during the manufacturing/assembly stage of the life cycle. The ERT also noted that the 2006 IPCC Guidelines contain a default methodology for estimating emissions from disposal (vol. 3, chap. 7, pp.7.50–7.51). The default methodology uses the amount of refrigerant initially charged into new systems installed in year (t-d) as AD (where t is the latest inventory year and d is the equipment lifetime). When estimating the amount of refrigerant initially charged into systems, all systems charged in the country (for the domestic market) and systems imported pre-charged should be considered. The Party provided the equipment lifetimes for subcategories 2.F.1.a, 2.F.1.c and 2.F.1.d in NIR table 4.36 (p.139).

The ERT recommends that the Party estimate and report emissions for all relevant stages of the life cycle of the equipment, including manufacturing and disposal emissions, for subcategories 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration. | Yes. Completeness |
| I.22 | 2.F.1.a Commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration – HFCs | The Party reported in NIR section 4.7 (pp.129–130) that, according to national law 56-Z of 2001 on the protection of the ozone layer (as amended by national laws 161-Z and 201-Z of 2014 and 2019 respectively), only entities operating equipment with more than 3 kg of HFCs are required to report on this equipment to the Ministry of Natural Resources and Environmental Protection every three years, starting in 2020. Data for 2020 were reported by entities operating such equipment for the first time in 2021. According to NIR section 4.7.1.1 (pp.133–134), these data were used to estimate HFC emissions for subcategories 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration for 1995−2020. The ERT noted that the exclusion of equipment containing less than 3 kg of HFCs from the reporting to the Ministry of Natural | Yes. Completeness |

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		Resources and Environmental Protection results in an underestimation of HFC emissions for subcategories 2.F.1.a, 2.F.1.c and 2.F.1.d. During the review, the Party clarified that no other reliable data sources apart from the reporting to the Ministry of Natural Resources and Environmental Protection have been identified and that estimating emissions from equipment containing less than 3 kg of HFCs is not currently a priority within the planned improvements for the national GHG inventory.	
		The ERT recommends that the Party estimate and report the missing HFC emissions from equipment containing less than 3 kg of HFCs for subcategories 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration for the complete time series.	
Agriculture			
A.14	3.B.4 Other livestock – CH_4 and N_2O	The Party reported in NIR table 5.16 (pp.177–178) the average annual population totals for poultry and the ratio of different species of poultry. The ERT noted that for 2021, the ratio of poultry subtypes compared with the total poultry population reported in NIR table 5.16 exceeded 100 per cent (e.g. the Party reported that chickens made up 2,069.5 per cent of all poultry animals). The ERT was therefore unable to estimate the correct value of the poultry population by subtype for 2021. The Party also reported in the NIR (p.178) that, at present, the number of poultry exceeds the 1990 level by 2.7 per cent. The ERT found that, on the basis of the data presented in NIR table 5.16, the poultry population in 2021 was roughly 10 per cent lower than in 1990. During the review, the Party clarified that the above statement reported in the NIR (p.178) on the growth of the poultry population refers to the population in 2019 compared with the population in 1990. The Party also provided an updated table of poultry population data and the per cent contribution of subtypes for the entire time series and confirmed that the correct values provided in the table were used for calculating CH_4 and N_2O emissions from poultry manure management.	Yes. Convention reporting adherence
		The ERT recommends that the Party correct the inconsistencies between the poultry population data reported in the NIR and the data used for the emission calculations and reported in CRF tables 3.B(a) (sheet 1) and 3.B(b), and report on this correction in the NIR of the next inventory submission.	
A.15	3.B Manure management – N_2O	The Party reported in CRF table 3.B(b) the amount of manure N excreted for each livestock category and subcategory and MMS (i.e. liquid, solid storage and dry lot, and pasture, range and paddock). In the same CRF table, the Party also reported the animal population and average manure Nex rate. The total amount of manure N obtained from the sum of the inputs from each MMS for each livestock category and subcategory should match the animal population multiplied by the average manure Nex rate (kg N/head/year). The ERT noted that there are inconsistencies for most livestock categories and subcategories, some of which are significant, particularly for poultry, fur-bearing animals and rabbits for 1990, 2005 and 2021. During the review, the Party clarified that these inconsistencies were related to the incorrect data on Nex per head reported in CRF table 3.B(b) for poultry, fur-bearing animals and rabbits for the entire time series. For non-dairy cattle, some minor inconsistencies also occurred because of the rounding of the Nex weighted mean per head (i.e. sex and age class). The Party further clarified that these inconsistencies did not affect the total estimate of the Nex for each MMS and provided a spreadsheet of Nex rates and emission calculations. The ERT agreed with the Party that the correct Nex rates were used for the emission calculations in line with the 2006 IPCC Guidelines (vol. 4, chap. 10, equation 10.30, p.10.57) and confirmed that the emission estimates reported in CRF table 3.B(b) were accurate.	Yes. Convention reporting adherence

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		The ERT recommends that the Party report the correct Nex rates associated with estimates of manure management N excretion for all livestock categories and subcategories for the entire time series in CRF table 3.B(b) in the next inventory submission.	
A.16	3.D.b Indirect N_2O emissions from managed soils – N_2O	The Party reported losses of N from various sources of N inputs through NH_3 volatilization and N leaching in CRF table 3.D. The ERT noted that the Party only accounted for leaching losses of N from inorganic N fertilizers, manure N applied to soils, urine and dung deposited on pasture, range and paddock by grazing animals, and crop residue decomposition. The ERT also noted that for the years when soil N_2O emissions were estimated for N mineralization resulting from losses of soil organic matter (i.e. for 2005), this source of N input was excluded from the estimate of N leaching from soils. According to equation 11.10 of the 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.21), loss of N through leaching should include F_{SOM}. In addition, the ERT was unable to replicate the estimates of NH_3 volatilization and N leaching using the default parameters and sources of N inputs for 2021. Based on the data reported in CRF table 3.D, the estimates of NH_3 volatilization and N leaching for 2021 calculated by the ERT were 4 per cent lower and 2 per cent higher respectively, than the values reported in CRF table 3.D. During the review, the Party clarified that F_{SOM} was excluded from the calculation of indirect soil N_2O emissions related to N leaching from managed soils. The Party further clarified that there was an incorrect calculation in its spreadsheets on the N input of synthetic fertilizers. Together, these errors resulted in inaccurate estimates of indirect soil N_2O emissions from NH_3 volatilization and N leaching. The ERT recommends that the Party correct the underestimation of NH_3 volatilization and the overestimation of N leaching, report accurate indirect soil N_2O emission estimates for NH_3 volatilization and N leaching for the entire time series and report on the resulting recalculations in the next inventory submission.	Yes. Accuracy
A.17	3.I Other carbon-containing fertilizers – CO_2	The ERT noted that the Party reported the AD and CO_2 emissions for category 3.I other carbon-containing fertilizers as "NO" in CRF table 3.G-I. The ERT found a publicly available reference (https://www.wm-strategy.com/belarus-urea-and-ammonium-nitrate-solutions-uan-market) indicating that Belarus produces urea ammonium nitrate. During the review, the Party clarified that it is difficult to confirm whether urea ammonium nitrate has been produced and used for agricultural activities and agreed to investigate whether such data are available. The ERT recommends that the Party collect data on agricultural use of urea ammonium nitrate and estimate and report the resulting CO_2 emissions under other carbon-containing fertilizers in CRF table 3.G-I. If data are not available on the use of urea ammonium nitrate in agriculture, the ERT recommends that the Party report CO_2 emissions for this category as "NE" in CRF table 3.G-I and provide an explanation for doing so in CRF table 9 and in the NIR until such data are available and the associated CO_2 emission estimates are reported.	Yes. Completeness
LULUCF			
L.15	4. General (LULUCF)	The ERT identified some inconsistencies in the reporting of areas and emissions between the NIR and the CRF tables for the LULUCF sector, as follows: (a) The reported total net removals for the LULUCF sector and for category 4.A forest land for 2021 are not consistent between NIR table 6.1 (p.199) (–42,937.62 and –49,452.01 kt CO_2 eq respectively) and CRF table summary 2 (–43,073.28 and –49,587.68 kt CO_2 eq respectively);	Yes. Convention reporting adherence

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		(b) The reported final area for category 4.F other land for 2000 is not consistent between NIR table 6.3 (pp.205–206) (958.0 kha) and CRF table 4.1 (948.56 kha);	
		(c) The reported area of settlements converted to forest land and the initial value for 1995 are not consistent between NIR table 6.4 (pp.214–217) (6.81 and 904.30 kha respectively) and CRF table 4.1 (4.38 and 901.87 kha respectively);	
		(d) The reported area of forest land converted to other land and the initial value for 2000 are not consistent between NIR table 6.4 (9.45 and 8,255.00 kha respectively) and CRF table 4.1 ("NA" and 8,245.56 kha respectively);	
		(e) The reported area of other land converted to wetlands and the initial value for 2015 are not consistent between NIR table 6.4 (2.3 and 506.5 kha respectively) and CRF table 4.1 (1.40 and 505.60 kha respectively).	
		During the review, the Party clarified that (1) the values for the total net removals for the LULUCF sector and for category 4.A reported in NIR table 6.1 are incorrect and the values reported in CRF table summary 2 are correct; (2) the correct final area for category 4.F other land for 2000 is 948.56 kha as reported in CRF table 4.1; (3) the correct area of settlements converted to forest land and the initial value for 1995 are 6.81 and 904.30 kha respectively, as presented in NIR table 6.4; (4) the correct area of forest land converted to other land and the initial value for 2000 are 9.45 and 8,255.00 kha respectively, as presented in NIR table 6.4; and (5) the correct area of other land converted to wetlands and the initial value for 2015 are 2.3 and 506.5 kha respectively, as presented in NIR table 6.4. The Party indicated that it would correct these inconsistencies between the CRF tables and the NIR in its next inventory submission. Nevertheless, the ERT finds that there is an issue of transparency because the areas were reported incorrectly in CRF table 4.1 (although this does not affect the reported emissions) and because there are data inconsistencies in the reported emission estimates and areas between the CRF tables and the NIR as identified above under (a) and (b) (although, these inconsistencies do not affect the accuracy of the estimates reported in the CRF tables).	
		The ERT recommends that the Party correct the inconsistencies in the reported emission estimates between NIR table 6.1 and CRF table summary 2 and correct the reported initial and final areas between CRF table 4.1 and NIR tables 6.3–6.4 in the next inventory submission.	
L.16	4. General (LULUCF)	The Party reported a planned improvement in NIR section 6.3 (p.218) to "take into account the twenty-year transfer of lands from one category to another (in the next inventory submission)". The ERT noted that this may imply that the Party does not currently apply the 20-year transition period for land converted from one land use to another. The Party does not currently report carbon stock changes in deadwood and mineral soils for land-use changes (see ID# L.1 in table 3). During the review, the Party provided AD for 1990–2021 for all land-use changes under settlements reported in the GHG inventory. These data clarified that the Party is correctly using the surrogate method and the 20-year transition period to report conversions between land uses for 1990–2008 and that AD are used for 2009–2021 for which a 20-year time series of land-use changes is available. The Party also clarified that it is making efforts to collect data back to 1970 (or appropriate surrogate data) in order to estimate soil carbon stock changes for land converted to grassland using the 20-year transition period. The ERT also noted that the 2006 IPCC Guidelines (vol. 4, chap. 3, p.3.9) state that the "commencement time for the historical data required is based on the amount of time needed for dead organic matter and soil carbon stocks to reach equilibrium following land-use conversion (20 years is recommended as a default, but can be longer)". As	Not an issue

		the Party does not currently estimate carbon stock changes in deadwood and mineral soils under land-use transition categories this does not affect the estimates reported in the 2023 inventory submission.	
		The ERT encourages the Party to use land-use change data back to 1970 (or appropriate surrogate data) to estimate soil carbon stock changes for all land conversions and apply the 20-year transition period to report the conversion of land from one category to another in accordance with the planned improvement of including complete estimates of biomass and soil emissions and removals for all land-use transitions. The ERT also encourages the Party to continue to use appropriate methods to determine the land-use change AD for conversions between all land-use categories from 1971 onward as provided in the 2006 IPCC Guidelines (vol. 1, chap. 5, p.5.8) so that the 20-year transition period for land-use changes can be appropriately applied.	
L.17	4.A.2 Land converted to forest land – CO_2	The Party reported in NIR table 6.25 (pp.243–244) the areas of drained peat soils converted to forest land. The ERT noted that the areas reported in NIR table 6.25 (e.g. 226.40 kha for 2021) are not consistent with the areas of organic soils converted to forest land reported in CRF tables 4.A (270.12 kha for 2021) and 4.1 (26.80 kha for 2021) and that the areas reported in these CRF tables are not consistent with the areas of drained organic soils on forest land reported in CRF table 4(II) (226.40 kha for 2021). The ERT also noted that area of organic soils was reported only under subcategory 4.A.2.3 wetlands converted to forest land, but emissions for this subcategory were reported as "NE" in CRF table 4.A (see ID# L.1 in table 3). CO_2 and N_2O emission estimates were reported for the area of drained organic soils in forest land in CRF table 4(II). During the review, the Party clarified that NIR table 6.25 includes areas drained over the entire period of drainage (including land that was drained for agricultural purposes and then converted to forest land). The Party also clarified that CRF table 4.A shows the drained areas since 1990 (applying the 20-year transition period) and includes both swamps and water object areas, as also shown in NIR table 6.25. The Party further clarified that CRF table 4.1 shows areas for a one-year transition period only. The ERT concluded that the Party did not provide fully transparent information in NIR table 6.25 as the table does not provide the area of the various elements included in the table. CRF table 4.A contains accurate data on organic soils converted to forest land under subcategory 4.A.2.3 but the explanation in the NIR does not clarify the areas that are and are not included in this subcategory.	Yes. Transparency
		The ERT recommends that the Party (1) report areas using the 20-year transition period in CRF table 4.A to ensure that the areas are consistent with those reported in CRF table 4.1 for the complete time series; (2) either exclude the land that was drained for agricultural purposes and then converted to forest land from NIR table 6.25, or include this subcategory as a separate column in NIR table 6.25 to ensure that the areas reported are consistent with those reported in CRF table 4(II); and (3) report the carbon stock changes in organic soils for subcategory 4.A.2.3 wetlands converted to forest land as "IE" instead of "NE" in CRF table 4.A, ensuring that these carbon stock changes are included elsewhere in the GHG inventory and provide a justification for doing so in the NIR and in CRF table 9.	
L.18	4.D Wetlands – CO_2, CH_4 and N_2O	The Party reported managed wetlands under unmanaged wetlands in CRF table 4.1. According to the 2006 IPCC Guidelines (vol. 4, chap. 3, p.3.6) "countries should describe the methods and definitions used to determine areas of managed and unmanaged lands. Managed land is land where human interventions and practices have been applied to perform production, ecological or social functions. All land definitions and classifications should be specified at the national level, described in a transparent manner, and be applied consistently over time. Emissions/removals of greenhouse gases do not need to be reported for unmanaged land. However, it is good practice for countries to quantify, and track over time, the area of unmanaged land so that consistency in area	Yes. Completeness

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		accounting is maintained as land-use change occurs". The Party reported the area of peat extraction (which is created by human activity) under the category wetlands (unmanaged) in CRF table 4.D. The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (vol. 4, chap. 7, p.7.5), where it is indicated that "managed wetlands will be restricted to wetlands where the water table is artificially changed (e.g. drained or raised) or those created through human activity (e.g. damming a river)". During the review, the Party acknowledged the inconsistency noted by the ERT and stated that all peat extraction areas will be accounted as managed land. In addition, in NIR section 6.7 (p.252), the Party stated that there is an area of 863 kha of bog in a natural or near-natural state in Belarus, of which 540 kha is in specially protected areas. The ERT also noted that for 2021, an area of 6.32 kha was reported under subcategory 4.D.1.1 peat extraction remaining peat extraction and an area of 147.30 kha was reported under subcategory 4.D.2.3 land converted to other wetlands in CRF table 4.D. Emissions for subcategory 4.D.2.3 were reported as "NE" in CRF table 4.D (see ID# L.1 in table 3). The sum of natural and near-natural wetlands, peat extraction land and land converted to other wetlands for 2021(1,016.62 kha) still leaves 204.88 kha unaccounted for in the total final area of wetlands (unmanaged) (1,221.50 kha) reported in CRF table 4.1. During the review, the Party clarified that the area of land converted to other wetlands resulted from natural waterlogging following land abandonment (i.e. of formerly managed land) and the consequent failure of land reclamation systems (water drainage). The ERT concluded that the Party's reporting is not fully consistent with the definition and guidance in the 2006 IPCC Guidelines on reporting managed land for wetlands in the CRF tables and the NIR. The ERT considers that a thorough assessment of wetland areas as managed or unmanaged will support the complete reporting of emissions for all mandatory subcategories (see ID# L.1 in table 3).	
		The ERT recommends that the Party (1) clearly document in its NIR the methods and definitions used to define wetland areas as either managed or unmanaged and report these areas in CRF table 4.1; (2) classify all peat extraction areas as managed land and report these areas under wetlands (managed) in CRF table 4.1; (3) include documentation in tabular and textual format in the NIR on the different types of wetland areas included in the overall wetland area and how these areas change over time; and (4) ensure complete reporting of emissions for all mandatory subcategories under category 4.D wetlands.	
L.19	4.E Settlements – CO_2	The Party reported living biomass stock changes for categories 4.E.1 settlements remaining settlements and 4.E.2 land converted to settlements as gains in CRF table 4.E, whereas the general expectation (particularly for subcategory 4.E.2.1 forest land converted to settlements) would be a loss of biomass carbon. During the review, the Party provided a table and the coefficients used to calculate the biomass carbon stock changes for categories 4.E.1 and 4.E.2 and clarified that the tier 2a method was used for category 4.E.1 and the tier 1 method for category 4.E.2. The Party stated that by using the tier 2a method for category 4.E.1, it is assumed that the decrease in carbon stocks is zero. This assumption can be made if the average age of the tree population is less than or equal to 20 years old, as indicated in the 2006 IPCC Guidelines (vol. 4, chap. 8, p.8.9). The Party explained that this assumption was used because there was no information available on disturbances, and that information on the number of disturbances is currently being collected, which will allow the percentage of young trees among the total tree population to be determined. The Party stated that once this information has been collected, a recalculation will be made and information on the assumptions used will be included in the NIR. The ERT noted that for the tier 1 method for land converted to settlements provided in the 2006 IPCC Guidelines (vol. 4, chap. 8, p.8.18) used by the Party for calculating biomass carbon stock changes for category 4.E.2, the most conservative approach is to set B_{AFTER} to zero, meaning that the conversion of land to settlements causes	Yes. Accuracy

		carbon stocks to be entirely depleted. Therefore, the formula used should mean that the carbon stock changes are reported as losses, whereas the Party reported the changes as gains. During the review, Belarus agreed that the carbon stock changes should be reported as losses instead of gains and that it will change its reporting accordingly in the future. The ERT concluded that the Party did not accurately estimate biomass carbon stock changes under category 4.E.	
		The ERT recommends that the Party (1) complete the collection of relevant data on the number of disturbances and apply the tier 2a method correctly to calculate the carbon stock change estimates for category 4.E.1 using parameters and assumptions that are fully justified and transparently reported in the NIR and report the revised estimates in the next submission; and (2) estimate biomass carbon stock changes in living biomass under category 4.E.2 land converted to settlements as losses instead of as gains, report the revised estimates in CRF table 4.E, document the revised estimates in the NIR and report the parameters and assumptions used for the calculations.	
L.20	4(IV) Indirect N_2O emissions from managed soils – N_2O	The Party reported as "IE" the AD and N_2O emissions for atmospheric deposition and N leaching and run-off in CRF table 4(IV). However, no explanation of where these emissions were included was provided in the documentation box to CRF table 4(IV), in CRF table 9 or in the LULUCF chapter of the NIR. During the review, the Party clarified that the AD and N_2O emissions are included in the agriculture sector and reported in CRF table 3.D under category 3.D.b indirect N_2O emissions from managed soils. This was not explained or documented in the agriculture chapter of the NIR; however, the ERT confirmed that these N_2O emissions were included in CRF table 3.D under category 3.D.b. The ERT concluded that the Party did not transparently provide information on its reporting of indirect N_2O emissions from managed soils.	Yes. Transparency
		The ERT recommends that the Party explain and document in the LULUCF chapter of the NIR where indirect N_2O emissions from managed soils are included and provide relevant information in CRF table 9.	
L.21	4(V) Biomass burning – CO and NO_X	The Party reported CO and NO_X emissions from forest fires in NIR tables 6.16 and 6.19 (pp.234 and 235–236 respectively) for forest wildfires and controlled burning. However, CO and NO_X emissions from forest wildfires and controlled burning were reported as "NO" in CRF table 4. During the review, the Party indicated that it will include these emissions in CRF table 4 in the next inventory submission.	Not an issue
		The ERT encourages the Party to include the full time series of CO and NO_X emissions in CRF table 4 in its next inventory submission, given that it has already performed the relevant calculations.	

Waste

| W.17 | 5.A.3 Uncategorized waste disposal sites – CH_4 | In CRF table 5.A, the Party reported a value of 3,152.46 kt for annual waste disposed of at SWDS for 2021 under category 5.A.3 uncategorized waste disposal sites. During the review, the Party provided an Excel file ("MSW IW time series") containing the AD for MSW and industrial waste generation and disposal for 1950–2021 and an Excel file ("SWD sludge") showing the quantity of sludge disposed of at SWDS for 1950–2021 (see ID# W.4 in table 3). For 2021, the Excel files include data disposal volumes of 3,153.40 kt for MSW, 172.88 kt for industrial waste and 95.16 kt for sewage sludge. The ERT noted that the sum of these values is higher than the total annual waste disposed of at SWDS reported in CRF table 5.A. The ERT also noted that inconsistencies in the reported data between CRF table 5.A and the Excel files persist throughout the time series. During the review, the Party checked the inputs to its calculation model and acknowledged the identified inconsistencies. The Party confirmed that the AD in the Excel files "MSW IW time series" and "SWD sludge" are correct and | Yes. Accuracy |

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		acknowledged that the calculation model and CRF tables contain incorrect data as they were not checked sufficiently for the whole time series. The Party identified that the inconsistencies were due to the transition to the use of the IPCC FOD model and the reallocation of all SWDS to category 5.A.3. The Party stated that it will recalculate the data for the entire time series in the next inventory submission using the IPCC FOD inventory software.	
		The ERT recommends that the Party rectify the inconsistencies identified in the AD on MSW, industrial waste and sewage sludge disposal between the internal calculation data files, the calculation model used and the CRF tables in the next inventory submission. The ERT also recommends that the Party recalculate the CH_4 emission estimates using the correct AD for the entire time series and document the impact of the recalculations in the NIR.	
W.18	5.B.1 Composting – N_2O	In NIR section 7.3.2 (p.276), the Party stated that the default N_2O EF for composting was used in accordance with the 2006 IPCC Guidelines (0.3 g N_2O/kg waste treated on a wet weight basis). However, the ERT noted that, according to the 2006 IPCC Guidelines (vol. 5, chap. 4, table 4.1, p.4.6), the default N_2O EF for composting is 0.24 g N_2O/kg waste treated on a wet weight basis. During the review, the Party clarified that it followed its English-language paper copy of the 2006 IPCC Guidelines, which states that the default N_2O EF for composting is 0.3 g N_2O/kg waste treated on a wet weight basis. The ERT noted that the only updated and corrected version of the 2006 IPCC Guidelines is the English version available online on the web pages of the IPCC Task Force on National Greenhouse Gas Inventories (https://www.ipcc-nggip.iges.or.jp/public/2006gl/). A total of 13 corrigenda to the 2006 IPCC Guidelines have been issued to date and, therefore, any paper copies the Party may have might not contain the various corrigenda. The third point of the ninth corrigenda to the 2006 IPCC Guidelines states, "In volume 5, chapter 4, page 4.6, table 4.1, the default emission factor for N_2O on a wet weight basis for composting should be 0.24 instead of 0.3." During the review, the Party clarified that it will apply the correct EF and perform the associated recalculations for the next inventory submission.	Yes. Accuracy
		The ERT recommends that the Party follow the guidance provided in the revised English version of the 2006 IPCC Guidelines available online (https://www.ipcc-nggip.iges.or.jp/public/2006gl/), apply the default N_2O EF for composting (0.24 g N_2O/kg waste treated on a wet weight basis) in its calculations, recalculate the associated emission estimates for the entire time series and document the impact of the recalculations in the NIR.	
W.19	5.B.1 Composting – CH_4	In CRF table 5.B, the Party reported CH_4 flared from composting of MSW for 2021 as "NE" without providing an explanation in CRF table 9 or in the NIR, while for 1990–2020 the Party reported this activity as "NO". During the review, the Party clarified that flaring of CH_4 from composting does not occur in Belarus and that it will report flaring of CH_4 from composting of MSW as "NO" in the next inventory submission.	Yes. Transparency
		The ERT recommends that the Party provide a transparent explanation in the NIR that CH_4 flaring from composting of MSW does not occur in the country and report "NO" accordingly in CRF table 5.B for the complete time series.	
W.20	5.B.1 Composting – CH_4 and N_2O	In NIR section 7.3.1 (p.276), the Party stated that 235.41 kt of waste was composted in 2021, without specifying whether the value is based on a wet or dry weight, while the same quantity of waste was reported in CRF table 5.B on a dry weight basis. The ERT noted that the default CH_4 and N_2O EFs used for the calculations and reported in the NIR (p.276) correspond to a wet weight basis for the same numeric quantity of waste composted. During the review, the Party clarified that 235.41 kt of waste on a wet weight basis was composted in 2021 and	Yes. Transparency

that the corresponding EFs were applied accordingly, resulting in accurate emission estimates. The Party stated that it will correct the inconsistency between the NIR and the CRF tables in the next inventory submission.

The ERT recommends that the Party specify in the NIR the weight basis (wet or dry) for the annual amount of MSW composted and ensure consistency with the value reported in CRF table 5.B on a dry weight basis for the complete time series and with the corresponding default CH_4 and N_2O EFs used for the calculations.

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
W.21	5.B.2 Anaerobic digestion at biogas facilities – CH_4	The Party reported the amount of CH_4 used for energy recovery from anaerobic digestion of MSW at biogas facilities as "NO" in CRF table 5.B for the complete time series (1990–2021). However, the ERT noted that this is inconsistent with the information provided in NIR section 7.3.1 (p.276), which states that the emissions from biogas generated from the mechanical-biological treatment of MSW at the Brest Waste Processing Plant, created in 2011, are reported in the energy sector. The Party also reported CH_4 emissions for this category as "NE" in CRF table 5.B and provided in the NIR (p.276) a justification for the insignificance of these emissions (amounting to 2.5 kt CO_2 eq) and the related reporting of "NE". The ERT also noted that the Party used an outdated CH_4 EF (1.0 g CH_4/kg waste treated on a wet weight basis) for this calculation, while the correct EF is 0.8 g CH_4/kg waste treated on a wet weight basis, as provided in the 2006 IPCC Guidelines (vol. 5, chap. 4, table 4.1, p.4.6) (see ID# W.9 in table 3). During the review, the Party confirmed that the biogas generated at the Brest Waste Processing Plant has been used for energy recovery since the start of its operations in 2011. The Party also stated that it will report the amount of CH_4 used for energy recovery from anaerobic digestion of MSW at biogas facilities as "NE" for 2011 onward. The ERT recommends that the Party estimate and report the quantity of CH_4 used for energy recovery from anaerobic digestion of MSW at biogas facilities from 2011 onward and, as applicable, report the corresponding actual CH_4 emissions for category 5.B.2 in CRF table 5.B and ensure that the resulting emissions from combustion of recovered CH_4 are included in the energy sector with the relevant related information provided in the NIR. In case the CH_4 used for energy recovery and the corresponding actual CH_4 emissions for category 5.B.2 are considered insignificant, the ERT recommends that the Party provide correct calculations of the likely level of emissions and relevant information on data and parameters used in the calculations in the NIR and in CRF table 9 and use the corresponding notation key in line with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Yes. Accuracy
W.22	5.C.1 Waste incineration – CO_2	The Party estimated non-biogenic CO_2 emissions from the incineration of clinical waste, sewage sludge (which may be biogenic; see also ID# W.24 below) and industrial solid waste. The Party reported in NIR table 7.3 (p.277) the default degradable organic carbon, fossil carbon, total carbon and water content values applied for the estimates for clinical waste, sewage sludge and industrial waste by industrial waste type, in line with the 2006 IPCC Guidelines (vol. 5, chap. 2, p.2.16). However, the ERT noted that, while the Party reported in CRF table 5.C the amount of clinical waste, sewage sludge and industrial waste incinerated, it did not provide in the NIR detailed AD for each waste component over the time series. Also, the Party did not report in the NIR the oxidation factor used to estimate CO_2 emissions. During the review, the Party provided the spreadsheet used to calculate CO_2 emissions for category 5.C.1 waste incineration for 2021, which includes detailed AD disaggregated by waste type (i.e. food/wood/paper, textiles, petroleum products/solvents/plastics, rubber, clinical waste and sludge). The Party also clarified the use of the default oxidation factor of 1 as provided in the 2006 IPCC Guidelines (vol. 5, chap. 5, table 5.2, p.5.18) for all waste incineration. Using the information provided by the Party, the ERT was able to understand the AD and methodology used for this category. At the same time, the	Yes. Transparency

ID#	Finding classification	Description of finding with recommendation or encouragement	Is finding an issue?[a]
		ERT recalls that paragraph 48 of the UNFCCC Annex I inventory reporting guidelines states that the NIR should ensure transparency and contain sufficiently detailed information to enable the inventory to be reviewed.	
		The ERT recommends that the Party provide in the NIR transparent information on the methodology, parameters and assumptions used for estimating CO_2 emissions (biogenic and non-biogenic) for this category, detailed AD for the whole time series for clinical waste, sewage sludge and industrial waste disaggregated by waste type (i.e. textiles, petroleum products/solvents/plastics and rubber) and the oxidation factor used.	
W.23	5.C.1 Waste incineration – N_2O	The Party reported in NIR section 7.4.2 (p.278) that it used the default EFs for batch-type incineration provided in the 2006 IPCC Guidelines to calculate emissions for subcategory 5.C.1.b non-biogenic (waste incineration). On the basis of the values reported in CRF table 5.C, the ERT confirmed that Belarus used the default N_2O EF for batch-type incineration of MSW (60 g N_2O/t wet waste) provided in table 5.6 of the 2006 IPCC Guidelines (vol. 5, chap. 5, p.5.22) to calculate emissions from incineration of industrial waste, clinical waste and sewage sludge. The ERT considers that it is reasonable to apply the default N_2O EF for MSW incineration to calculate emissions from clinical waste incineration, as there is no IPCC default N_2O EF for clinical waste incineration. However, the ERT notes that this assumption is inconsistent with the specific default N_2O EF values for incineration of industrial waste (100 g N_2O/t wet waste), sewage sludge (900 g N_2O/t wet waste) and sludge (except sewage sludge) (450 g N_2O/t wet waste) provided in table 5.6 of the 2006 IPCC Guidelines (vol. 5, chap. 5, p.5.22) and results in an underestimation of N_2O emissions for category 5.C.1 waste incineration. During the review, the Party stated that it intends to apply the appropriate default N_2O EFs for industrial waste and sewage sludge in the next inventory submission.	Yes. Accuracy
		The ERT recommends that the Party apply in its calculations the specific default N_2O EFs for industrial waste and for sewage sludge or sludge incineration in accordance with table 5.6 of the 2006 IPCC Guidelines (vol. 5, chap. 5, p.5.22), recalculate the associated emission estimates for the entire time series and document the recalculations and their impact in the NIR.	
W.24	5.C.1 Waste incineration – CO_2	The Party reported CO_2 emissions from sewage sludge incineration under subcategory 5.C.1.b non-biogenic (waste incineration) in CRF table 5.C. The ERT noted that incineration of sewage sludge is usually reported under subcategory 5.C.1.a biogenic (waste incineration) since the default fossil carbon fraction provided in the 2006 IPCC Guidelines (vol. 5, chap. 5, table 5.2, p.5.18) is 0 per cent. During the review, the Party clarified that sewage sludge incinerated in Belarus consists of "some type of fossil-fuel derived material generated from chemical facilities" but did not indicate the fossil carbon fraction in sewage sludge used to calculate the emission estimates. The ERT noted that in its calculations, the Party assumed that the carbon in sewage sludge consists wholly of fossil carbon (see ID# W.22 above).	Yes. Transparency
		The ERT recommends that the Party provide a justification in the NIR for reporting the CO_2 emission estimates for sewage sludge incineration under subcategory 5.C.1.b non-biogenic (waste incineration) and report in the NIR the country-specific fossil carbon fraction in sewage sludge used, including the data source and justification, and report the corresponding CO_2 emissions from non-biogenic and biogenic waste incineration. Alternatively, the ERT recommends that the Party estimate CO_2 emissions from sewage sludge incineration using the default fossil carbon fraction (0 per cent) provided in the 2006 IPCC Guidelines (vol. 5, chap. 5, table 5.2, p.5.18) and report these emissions under subcategory 5.C.1.a.	

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

Annex I

Overview of greenhouse gas emissions and removals as reported by Belarus in its 2023 inventory submission

1.   Tables I.1–I.3 provide an overview of the total GHG emissions and removals as reported by Belarus.

Table I.1
Total greenhouse gas emissions and removals for Belarus, 1990–2021
(kt CO$_2$ eq)

	Total GHG emissions and removals excluding indirect CO$_2$ emissions		Total GHG emissions and removals including indirect CO$_2$ emissions[a]	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*
1990	115 940.81	145 339.89	NA	NA
1995	58 018.69	87 955.99	NA	NA
2000	46 508.15	81 145.92	NA	NA
2010	45 738.05	91 884.27	NA	NA
2015	44 498.80	88 307.46	NA	NA
2020	52 491.86	89 940.28	NA	NA
2021	48 914.92	91 988.20	NA	NA

Note: Emissions and removals reported for the sector other (sector 6) are not included in the total GHG emissions.
[a] The Party did not report indirect CO$_2$ emissions in CRF table 6.

Table I.2
Greenhouse gas emissions and removals by gas for Belarus, excluding land use, land-use change and forestry, 1990–2021
(kt CO$_2$ eq)

	CO$_2$[a]	*CH$_4$*	*N$_2$O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF$_6$*	*NF$_3$*
1990	108 345.06	20 770.34	16 224.49	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
1995	60 905.64	15 952.52	11 059.79	3.88	18.68	NO, NE	4.74	10.73
2000	54 905.98	15 093.48	11 103.09	9.13	18.68	NO, NE	4.84	10.73
2010	62 445.12	16 727.66	12 599.35	80.63	16.09	NO, NE	6.18	9.24
2015	58 798.91	17 221.80	12 094.37	164.42	13.92	NO, NE	6.05	7.99
2020	59 055.55	17 678.09	12 978.35	200.98	10.66	NO, NE	10.53	6.12
2021	60 938.20	17 875.94	12 938.02	208.96	10.54	NO, NE	10.49	6.05
Percentage change 1990–2021	–43.8	–13.9	–20.3	NA	NA	NA	NA	NA

Note: Emissions and removals reported for the sector other (sector 6) are not included in this table.
[a] Belarus did not report indirect CO$_2$ emissions in CRF table 6.

Table I.3
Greenhouse gas emissions and removals by sector for Belarus, 1990–2021
(kt CO_2 eq)

	Energy	IPPU	Agriculture	LULUCF	Waste	Other
1990	105 289.29	5 667.74	29 869.32	–29 399.08	4 513.54	NO
1995	60 224.00	3 558.40	20 134.78	–29 937.29	4 038.81	NO
2000	54 222.40	4 171.99	18 303.67	–34 637.77	4 447.87	NO
2010	59 916.05	5 877.42	20 919.69	–46 146.22	5 171.11	NO
2015	56 237.56	6 035.85	20 473.15	–43 808.66	5 560.91	NO
2020	56 696.37	6 274.46	21 139.73	–37 448.42	5 829.72	NO
2021	58 521.59	6 311.85	21 178.89	–43 073.28	5 975.87	NO
Percentage change 1990–2021	–44.4	11.4	–29.1	46.5	32.4	NA

Note: Belarus did not report indirect CO_2 emissions in CRF table 6.

Annex II

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) 1.A.3 transport – biomass (CO_2, CH_4 and N_2O) (see ID# E.33 (c–d) in table 3);

(b) 2.B.10 other (chemical industry) (CO_2) (see ID# I.16 in table 5);

(c) 2.D non-energy products from fuels and solvent use (CO_2, CH_4 and N_2O) (see ID# I.9 in table 3);

(d) 2.F product uses as substitutes for ozone-depleting substances (HFCs, PFCs, SF_6 and NF_3) (see ID# I.11 in table 3);

(e) 2.F.1.a commercial refrigeration, 2.F.1.c industrial refrigeration and 2.F.1.d transport refrigeration (HFCs) (see ID#s I.21 and I.22 in table 5);

(f) 2.G.1 electrical equipment (SF_6) (see ID# I.13 in table 3);

(g) 2.G.2 SF_6 and PFCs from other product use (SF_6 and PFCs) (see ID# I.14 in table 3);

(h) 3.F field burning of agricultural residues (CH_4 and N_2O) (see ID# A.12 in table 3);

(i) 3.I other carbon-containing fertilizers (CO_2) (see ID# A.17 in table 5);

(j) 4.A.2 land converted to forest land, 4.B.2 land converted to cropland, 4.C.2 land converted to grassland, 4.D wetlands and 4.F other land (CO_2) (see ID# L.1 and L.8 in table 3, and L.18 in table 5);

(k) 4(I) direct N_2O emissions from N inputs to managed soils – settlements remaining settlements – inorganic N fertilizers (N_2O) (see ID# L.1 in table 3);

(l) 4(II) emissions and removals from drainage and rewetting and other management of organic and mineral soils (CO_2, CH_4 and N_2O) (see ID# L.1 in table 3);

(m) 4(III) direct N_2O emissions from N mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils (N_2O) (see ID# L.1 in table 3);

(n) 4(V) biomass burning – wetlands remaining wetlands and land converted to wetlands – wildfires (CO_2, CH_4 and N_2O) (see ID# L.1 in table 3).

Annex III

Reference documents

A.   Reports of the Intergovernmental Panel on Climate Change

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at https://www.ipcc.ch/publication/good-practice-guidance-and-uncertainty-management-in-national-greenhouse-gas-inventories/.

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at https://www.ipcc.ch/publication/good-practice-guidance-for-land-use-land-use-change-and-forestry/.

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 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, 2015, 2016, 2017, 2019 and 2021 inventory submissions of Belarus, contained in documents FCCC/ARR/2012/BLR, FCCC/ARR/2013/BLR, FCCC/ARR/2015/BLR, FCCC/ARR/2016/BLR, FCCC/ARR/2017/BLR, FCCC/ARR/2019/BLR and FCCC/ARR/2021/BLR 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 Belarus for 2023. Available at https://unfccc.int/sites/default/files/resource/asr2023_BLR.pdf.

Conclusions and recommendations of the sixteenth meeting of GHG inventory lead reviewers. Available at https://unfccc.int/sites/default/files/resource/04_GHG-LRs-2019-conclusions_0.pdf.

C.   Other documents used during the review

Responses to questions during the review were received from Kristina Gonchar (Republican Scientific Research Unitary Enterprise "BEL NIC Ecology"), 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:

Increasing the methodological level of calculating carbon dioxide emissions from the combustion of automobile fuel and heating oil – Nature Management 2023 No. 1 (p.85) – D.V. Melekh, I.P. Narkevich.

Order of the national statistical committee - the Republic of Belarus - 27/06/2017 No. 93, Policy on ensuring confidentiality primary statistical data (in Russian).

Rules for calculating greenhouse gas emissions in the main sectors of the economy of the republic of Belarus - TCH 17.09–05–2013 (02120) (in Russian).

Technical code of common practice TCH 08/17/09/2018 (33140) "Environmental protection and nature management. Atmospheric air. Emissions of pollutants into atmospheric air. Sources of emissions and procedure for calculating emissions from main gas pipelines".

Transition to the tier 2 methodology for estimating carbon dioxide emissions from stationary combustion of natural gas – the Republic Scientific and Research Unitary Enterprise "Ecology" – D. V. Melekh.

Ways to increase energy security of the Republic of Belarus – Belarusian model of a socially oriented market economy (section 5, pp.182–185) – M.D. Ioffe (in Russian). Available at: https://core.ac.uk/download/pdf/212979253.pdf.