



United Nations

FCCC/ARR/2019/BLR



Framework Convention on
Climate Change

Distr.: General
4 June 2020

English only

Report on the individual review of the inventory submission of Belarus submitted in 2019*

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 inventory review of the 2019 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 23 to 28 September 2019 in Bonn.

* In the symbol for this document, 2019 refers to the year in which the inventory was submitted, not to the year of publication.

GE.20-07381(E)



* 2 0 0 7 3 8 1 *

Please recycle 



Contents

	<i>Paragraphs</i>	<i>Page</i>
Abbreviations and acronyms		3
I. Introduction	1–5	5
II. Summary and general assessment of the 2019 inventory submission	6	6
III. Status of implementation of issues raised in the previous review report.....	7	7
IV. Issues identified in three successive reviews and not addressed by the Party	8	42
V. Additional findings made during the individual review of the 2019 inventory submission.....	9	47
Annexes		
I. Overview of greenhouse gas emissions and removals for Belarus for submission year 2019, as submitted by Belarus.....		61
II. Additional information to support findings in table 2 in this report.....		63
III. Reference documents		64

Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
Belstat	National Statistical Committee of the Republic of Belarus
BKB	brown coal briquettes
C	carbon
CaO	calcium oxide
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
DOC	degradable organic carbon
EF	emission factor
ERT	expert review team
FAO	Food and Agriculture Organization of the United Nations
Frac _{GASM}	fraction of volatile nitrogen for liquid systems for non-dairy cattle
Frac _{LOSS}	fraction of nitrogen lost from dairy cattle manure kept in liquid systems
GE	gross energy
GHG	greenhouse gas
HFC	hydrofluorocarbon
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	<i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i>
IPCC good practice guidance for LULUCF	<i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>
IPPU	industrial processes and product use
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MCF	methane conversion factor
MMS	manure management system(s)
MSW	municipal solid waste
N	nitrogen
N ₂ O	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
Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
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	<i>2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands</i>

I. Introduction

1. This report covers the review of the 2019 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” (decision 13/CP.20). The review took place from 23 to 28 September 2019 in Bonn and was coordinated by Claudia do Valle, Javier Hanna and Peter Iversen (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Belarus.

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

<i>Area of expertise</i>	<i>Name</i>	<i>Party</i>
Generalist	Agita Gancone	Latvia
	Olia Glade	New Zealand
Energy	Leonidas Osvaldo Girardin	Argentina
	Gherghita Nicodim	Romania
	Peter Seizov	Bulgaria
IPPU	Kent Buchanan	South Africa
	Kakhaberi Mdivani	Georgia
	Jolanta Merkeleiene	Lithuania
	Su Mingshan	China
Agriculture	Michael Anderl	Austria
	Juan José Rincón Cristóbal	Spain
LULUCF	Maria Fernanda Alcobé	Argentina
	Valentyna Slivinska	Ukraine
	Midori Yanagawa	Japan
Waste	Cristobal Felix Diaz Morejon	Cuba
	Gabor Kis-Kovacs	Hungary
	Martiros Tsarukyan	Armenia
Lead reviewers	Olia Glade	
	Kakhaberi Mdivani	

2. The basis of the findings in this report is the assessment by the ERT of the Party’s 2019 inventory submission in accordance with the UNFCCC review guidelines. The ERT notes that the individual inventory review of Belarus’s 2018 inventory submission did not take place in 2018 owing to insufficient funding for the review process.

3. The ERT has made recommendations that Belarus resolve the findings related to issues.¹ Other findings, and, if applicable, the encouragements of the ERT to Belarus to resolve them, are also included.

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

5. Annex I shows annual GHG emissions for Belarus, including totals excluding and including the LULUCF sector, indirect CO₂ emissions, and emissions by gas and by sector.

¹ Issues are defined in decision 13/CMP.20, annex, para. 81.

II. Summary and general assessment of the 2019 inventory submission

6. Table 2 provides the assessment by the ERT of the 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 inventory of Belarus

Assessment		Issue ID#(s) in table 3 and/or 5 ^a	
Date of submission	Original submission: 12 April 2019 (NIR), 12 April 2019 (CRF tables) version 2		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:		
	(a) Identification of key categories?	Yes	G.25
	(b) Selection and use of methodologies and assumptions?	Yes	G.3, E.43, E.50, A.22, W.2
	(c) Development and selection of EFs?	Yes	E.2, E.22, E.33, E.34, E.35, E.43, E.46, E.52, E.53, E.55, A.33, L.16, L.18, W.7
	(d) Collection and selection of AD?	Yes	E.9, E.19, E.20, E.48, I.4, I.7, I.23, A.5, A.13, A.26, A.27, A.32, A.34, A.35, L.19, W.6, W.8, W.16
	(e) Reporting of recalculations?	Yes	G.20, G.21, E.44
	(f) Reporting of a consistent time series?	Yes	I.3, I.11, L.14, W.11
	(g) Reporting of uncertainties, including methodologies?	Yes	G.22, G.23, G.24, L.2, A.9
	(h) QA/QC?	Yes	G.10, G.11, G.13, G.15, G.16, G.17, G.19, E.3, E.4, E.12, E.40, A.24, L.3, L.4, L.5
	(i) Missing categories/completeness? ^b	Yes	G.1, E.25, E.45, E.54, I.17, I.18, I.19, I.21, I.25, L.1, L.9, L.11, W.3, W.13, W.19, W.20
	(j) Application of corrections to the inventory?	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	G.18
National inventory arrangements	Have any issues been identified with the effectiveness and reliability of the institutional, procedural and legal arrangements for estimating GHG emissions?	Yes	G.1, G.3, G.16, G.26

<i>Assessment</i>		<i>Issue ID#(s) in table 3 and/or 5^a</i>
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No

^a The ERT identified additional issues in all sectors as well as issues that are not listed in this table but are included in table 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 issues raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 22 June 2018.² For each issue, the ERT specified whether it believes the issue has been resolved by the conclusion of the review of the 2019 inventory submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues raised in the previous review report of Belarus

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous report</i>	<i>ERT assessment and rationale</i>
General			
G.1	AD (G.3, 2017) (G.3, 2016) (G.3, 2015) (table 3, 2013) (8, 2012) Completeness	Collect AD and estimate emissions for all categories and subcategories which are currently reported as “NE”, but for which the IPCC provides estimation methods.	Addressing. Belarus has improved the completeness of the inventory by reporting CO ₂ emissions for category 2.A.4.a (ceramics) in CRF table 2(I).A-Hs1; and by reporting appropriate notation keys (“NO”) for CH ₄ and N ₂ O emissions from asses under categories 3.A.4 (other livestock) and 3.B.4 (other livestock), including for VS and maximum methane producing capacity (reported correctly as “NA”) under fur-bearing animals in CRF table 3.B(a)s1. However, in its 2019 GHG inventory submission Belarus still reported as “NE” a number of categories for which the IPCC provides estimation methodologies (see all completeness issues under the sectoral parts of this report).
G.2	Annual submission (G.1, 2017) (G.1, 2016) (G.1, 2015) (6, 2013) Convention reporting adherence	Submit inventories by 15 April each year as required by decision 18/CP.8.	Resolved. Belarus submitted its 2019 annual GHG inventory submission for 1990–2017 on 12 April 2019, before the deadline indicated in decisions 18/CP.8 and 24/CP.19.

² FCCC/ARR/2017/BLR. The ERT notes that the individual review of Belarus’s 2018 inventory submission has not been published yet. As a result, the latest previously published annual review report reflects the findings of the review of the Party’s 2017 inventory submission.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
G.3	Inventory planning (G.8, 2017) (G.8, 2016) (G.8, 2015) (12, 2013) (27, 2012) Accuracy	Enhance efforts to implement improvements to the inventory by using higher-tier estimation methods and country-specific EFs for key categories, in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF.	Addressing. As identified in previous reviews, Belarus uses higher-tier estimation methods and country-specific EFs for the following key categories only: CO ₂ emissions under 2.A.1 (cement production) and 2.B.1 (ammonia production); CH ₄ emissions under 3.A (enteric fermentation); CH ₄ and N ₂ O emissions under 3.B (manure management); and CO ₂ emissions and removals under 4A (forest land). NIR table 1.3 has not been updated to reflect the key categories with higher-tier estimation. The ERT noted that there have been no changes since the previous submission and, for the rest of the key categories, estimates were calculated using tier 1 methods and default EFs (see also ID#s E.2, E.22, E.26 and E.35 below). During the review, the Party stated that it continuously implements in the inventory all new information as it becomes available. The national inventory team cooperates with industrial enterprises and scientific and research institutions. Belarus stated that currently there are no legal instruments to compel external agencies to provide the information on a voluntary basis.
G.4	Inventory planning (G.12, 2017) (G.12, 2016) (G.12, 2015) (table 4, 2013) (13, 2012) Transparency	Report in the NIR whether the key category analysis is used in the prioritization of developments in and improvements to the inventory.	Not resolved. Belarus did not provide information in the NIR to indicate whether it uses the key category analysis for prioritizing developments of and improvements to its inventory. During the review, the Party explained that its national inventory team takes into account the key category analysis when prioritizing developments of and improvements to its inventory, but it is mainly the availability of the initial information that determines the improvements to the inventory.
G.5	Inventory management (G.7, 2017) (G.7, 2016) (G.7, 2015) (11, 2013) (26, 2012) Transparency	Include in the NIR information on the personnel involved in the development and management of the inventory in order to demonstrate sufficient levels of capacity and expertise to undertake the various tasks and roles within the inventory team.	Not resolved. Belarus did not include in the NIR information on the personnel involved in developing and managing the inventory, including a detailed description of the tasks and specific expertise of each expert, to demonstrate that there is sufficient capacity and expertise to undertake the various tasks and roles within the inventory team. During the review, the Party explained that information on the experts involved, the tasks and the specific expertise of each expert will be included in its inventory submission.
G.6	Inventory management (G.20, 2017) Convention reporting adherence	Align the reporting on the national inventory arrangements in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 50(j), by providing a description of the legal, institutional and procedural arrangements for the preparation of the GHG inventory, together with clear information on the roles and responsibilities of all organizations contributing to the preparation of annual inventories, as well as on	Addressing. Belarus included an overall description of the legal, institutional and procedural arrangements for the preparation of the GHG inventory in the NIR (sections 1.2.1–1.2.2, pp.13–14, and section 1.3, pp.16–21). In the NIR (section 1.1, pp.12–13) Belarus explained that according to order 47 of 29 December 2005 the Belarusian Scientific and Research Centre “Ecology” is defined as the “center for the greenhouse gas inventory, inventory management and preparation of national communications to the UNFCCC secretariat”. However, Belarus did not include information on changes in the national inventory

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
		changes in the national institutional arrangements.	arrangements. During the review, the Party explained that there have been no changes in the national institutional arrangements since its previous submission and that it will include more information in the next NIR.
G.7	Key category analysis (G.11, 2017) (G.11, 2016) (G.11, 2015) (table 4, 2013) Convention reporting adherence	Undertake a key category analysis following the IPCC good practice guidance.	Resolved. Belarus reported a key category analysis including level and trend assessment in accordance with the 2006 IPCC Guidelines (see NIR annex 4, tables 4.1–4.6, pp.216–237).
G.8	Key category analysis (G.17, 2017) (G.18, 2016) (G.18, 2015) Convention reporting adherence	Ensure better consistency between the key category analysis reported in the NIR and the CRF tables and correct, as necessary, the key category analysis reported in the NIR.	Resolved. Belarus reported on its key category analysis in the NIR (annex 4, tables 4.1–4.6, pp.216–237). The level of category aggregation at which the key category analysis was done is consistent with the key category assessment reported in CRF table 7.
G.9	Methods (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 provide background information on all AD used in the inventory, specifically for the energy and industrial processes sectors.	Addressing. The reporting of methodologies and procedures has improved in the latest submission of Belarus (e.g. see ID#s I.1, I.14 and I.20 below). However, the Party did not include summary tables for the EFs and AD used in the inventory, including descriptions of the methodologies used for each subcategory for the energy sector (e.g. see ID# E.1 below). During the review, the Party explained that it will continue to provide more detailed information on the methodologies and parameters used for the estimations and the data-collection process in order to ensure the transparency of the reporting.
G.10	NIR (G.2, 2017) (G.2, 2016) (G.2, 2015) (7, 2013) Convention reporting adherence	Provide the missing sections in the NIR following the structure outlined in the UNFCCC Annex I inventory reporting guidelines.	Addressing. Belarus included the national energy balance for the most recent year in the NIR (annex 3, pp.213–215) and provided a comparison between the reference approach and the sectoral approach in the NIR (section 3.2.1) (see ID# E.10 below). There is some information in the sectoral parts of the NIR on indirect CO ₂ and N ₂ O emissions. However, the Party did not align its reporting to provide information in the NIR as required by the UNFCCC Annex I inventory reporting guidelines. The ERT notes that the structure outlined in the appendix to the reporting guidelines is intended to help Parties report all mandatory information in the NIR. Currently, Belarus does not include sufficient information in the NIR on recalculations and improvements (chap. 10). During the review, the Party stated that all the missing sections will be included in the next NIR.
G.11	NIR (G.21, 2017) Convention reporting adherence	Provide the missing sections in the NIR following the structure outlined in the UNFCCC Annex I inventory reporting guidelines.	Not resolved. In addition to the issue raised in ID# G.10 above, Belarus did not provide information on changes in the national inventory arrangements since the previous annual inventory submission (chap. 1.2.4.); a general uncertainty evaluation, including data on the overall uncertainty of the inventory totals (chapter 1.6.); an annex on the assessment of uncertainty; an annex with a detailed

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
			methodological description for individual source or sink categories; or subchapters on time-series consistency at the category level for the category feedstocks and NEU of fuels.
G.12	Notation keys (G.25, 2017) Comparability	Complete all cells in the CRF tables, ensuring that no cells are left blank.	Resolved. Belarus completed all cells in the CRF tables, ensuring that no cells were left blank.
G.13	Notation keys (G.25, 2017) Comparability	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.	Addressing. Belarus improved its reporting of notation keys, but some inconsistencies remain. For example, the Party reported “NO” for CO ₂ , CH ₄ and N ₂ O emissions instead of “NE” for category 2.G.4 (other, under other products manufacture and use) and “NO” instead of “NA” for CO ₂ , CH ₄ and N ₂ O emissions for category 2.H (other). See also ID#s G.1 above, G.14, E.4 and W.5 below, and E.59, I.25, I.26, L.13, L.15, L.17 and W.13 in table 5.
G.14	Notation keys (G.25, 2017) Comparability	Provide justification for the use of notation keys, particularly “NE” and “IE”, in the NIR and in CRF table 9.	Addressing. In CRF table 9 Belarus included a justification for the use of notation keys for the following categories only: “NE” (for 1990–2017) for category 3.D.1.5 (mineralization/immobilization associated with loss/gain of soil organic matter); and “IE” (for 1990–2000) for category 1.A.2.a (iron and steel). However, there are a number of categories for which “NE” and “IE” are applied without proper justification in CRF table 9 (e.g. “NE” for categories 2.D.1, 2.D.2, 4.E and 5.A.3, and “IE” for categories 1.A.3.i, ii, iii and iv and 2.C.1.a). The NIR does not contain justifications for the use of notation keys, including an assessment of completeness to justify exclusion for the sources reported as “NE” (UNFCCC Annex I inventory reporting guidelines, para. 37).
G.15	QA/QC and verification (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.	Not resolved. The ERT noted that a number of issues were identified during the review, indicating that complete and robust QA/QC procedures have not been implemented for the preparation of the inventory (see ID#s G.13 and G.14 above, and G.16, G.17, G.19, E.3, E.4, E.12, E.40, A.24, L.3, L.4 and L.5 below).
G.16	QA/QC and verification (G.10, 2017) (G.10, 2016) (G.10, 2015) (13, 2013) (19, 2012) Transparency	Report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories, and use the information available on internal and external reviews to help develop the section of the NIR that describes the QA/QC procedures undertaken.	Addressing. Belarus reported some information in its NIR on sectoral QA/QC procedures for some sectors, mainly for key categories, such as category 3.A (enteric fermentation) (section 5.2.4, pp.97–99), category 3.B (manure management) (section 5.3.4, pp.108–109) and category 5.A.2 (unmanaged waste disposal) (section 7.2.2.4, p.189). However, the NIR still provides limited information on the QA/QC procedures implemented for key categories, including those in the energy sector (section 3.2.7, pp.35–36), for which QC procedures were reported only at the level of category 1.A (fuel combustion) and for LULUCF (section 6.2.4, p.173) for forest land. Also, the Party did not clarify whether internal or external reviews were used to develop the sections of the QA/QC description. Belarus explained during the review

ID#	Issue classification ^{a, b}	Recommendation made in previous report	ERT assessment and rationale
G.17	QA/QC and verification (G.18, 2017) (G.19, 2016) (G.19, 2015) Convention reporting adherence	Improve the QC procedures to ensure consistency in the information presented in CRF table 10 and the NIR for the different gases and sectors.	<p>that it will present a more detailed description of the QA/QC procedures in its next NIR.</p> <p>Addressing. Belarus corrected the inconsistencies between CRF table 10 and the NIR for the following issues identified in the original recommendation:</p> <p>(a) The decrease in removals from LULUCF in CRF table 10s1 and the NIR (table ES.3) (–36.98 per cent);</p> <p>(b) The decrease in N₂O emissions between CRF table 10s4 and NIR table 3.1 (–59.51 per cent);</p> <p>(c) The decrease in N₂O emissions from the IPPU sector between CRF table 10s4 and NIR table 4.1 (–0.54 per cent);</p> <p>(d) The CO₂ eq emissions for category 3.B between CRF table 10s1 and NIR table 5.2;</p> <p>(e) The CO₂ eq emissions for the agriculture sector between CRF table 10s1 and NIR table 5.2;</p> <p>(f) NIR table 6.1 indicates the correct values in CO₂ eq and is consistent with CRF table 10s1.</p> <p>However, there are still discrepancies in the values for total waste emissions (in t CO₂ eq) from 2003 to 2008 and 2011 between the NIR (table 7.1, pp.181–182) and CRF table 10s1. No other discrepancies were observed by the ERT between the information in CRF table 10 and the information in the NIR.</p>
G.18	QA/QC and verification (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.	<p>Addressing. The ERT noted that limited information is provided in the NIR (section 2.3, p.25) on the reasons for the observed trends in emissions across the time series at the sectoral level and for the most important categories within these sectors (e.g. for energy (section 3.2.3, p.32), IPPU (section 4.1.1, p.40), agriculture (sections 5.1, pp.82–83, 5.2, pp.85–91, and 5.4, pp.110–111), LULUCF (sections 6.1, pp.121–122, and 6.2.2, pp.153–154) and waste (section 7.1, pp.181–182)). The ERT noted that the reporting on the changes in the trends is still not transparent and in line with the UNFCCC Annex I inventory reporting guidelines. During the review, the Party explained that it will provide more information on trends in emissions in its next submission.</p>
G.19	QA/QC and verification (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.	<p>Not resolved. Belarus included in the NIR overall information on the QA/QC arrangements implemented and the QA/QC plan (section 1.2.3), as well as a list of general QC procedures (table 1.1, pp.14–16), and stated in the NIR (p.14) that the inventory as a whole was checked and approved for submission by the Ministry of Natural Resources and Environmental Protection. However, Belarus did not provide in the NIR detailed information on its QA/QC plan (i.e. if there is a plan, with</p>

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			<p>specific QA objectives, activities, time frames and defined institutional responsibilities; the role of QA arrangements in the inventory planning and improvement process; and the QA/QC procedures already implemented or planned to be implemented in the future). During the review, the Party explained that it will continue to improve QA/QC procedures and will include detailed information on QA/QC arrangements, the detailed QA/QC plan, a detailed description of the QA/QC procedures and the improvement plan in its next inventory submission.</p>
G.20	Recalculations (G.15, 2017) (G.16, 2016) (G.16, 2015) Comparability	Report CRF tables on recalculations with all the necessary information fully in accordance with the UNFCCC Annex I inventory reporting guidelines and using the agreed tables included in decision 24/CP.19, annex II.	Addressing. Belarus reported recalculations in CRF table 8; however, some cells are blank (e.g. for categories 2.C.4, 2.C.7, 2.E.1–2.E.4, 2.F.2, 2.F.3, 2.F.5 and 2.F.6). During the review, the Party explained that there are still some shortcomings in reporting the recalculations in CRF table 8 and this issue will be resolved in the next inventory submission.
G.21	Recalculations (G.16, 2017) (G.17, 2016) (G.17, 2015) Transparency	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.	Addressing. In the NIR, Belarus continued to provide limited information on recalculations at the sectoral level (e.g. in sections 3.2.2.3, 4.2.1.5, 5.1.4, 5.3.5 and 5.4.5).
G.22	Uncertainty analysis (G.13, 2017) (G.13, 2016) (G.13, 2015) (table 4, 2013) (14, 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. Belarus did not provide an estimate of the cumulative uncertainty of the total GHG emissions for 2017, in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 50(g); or information on how the uncertainty analysis was used to prioritize inventory improvements. The values for parameters used in the uncertainty analysis were not adequately documented. During the review, Belarus indicated that it will follow the recommendations of the ERT concerning the uncertainties and their role in prioritizing inventory improvements.
G.23	Uncertainty analysis (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.	Not resolved. Belarus did not report quantitative estimates of the uncertainty assessment for the base year, the latest inventory year or the trend uncertainty between those two years in the NIR. During the review, Belarus indicated that it will make all efforts to perform the uncertainty assessment in accordance with the reporting requirements and will report thereon in its next submission.
G.24	Uncertainty analysis (G.23, 2017) Convention reporting adherence	Report uncertainties for the base year and the latest inventory year as well as the methods and underlying assumptions used.	Not resolved. Belarus did not perform and report uncertainty assessments for the base year and the latest inventory year including explanation of methods and underlying assumptions. During the review, the Party indicated that it will make all efforts to perform the uncertainty assessment in accordance with

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			the reporting requirements and report thereon in its next submission.
Energy			
E.1	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (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.	Not resolved. Although Belarus provided a disaggregated energy balance in NIR annex 3, it has not addressed previous recommendations to provide summary tables for the AD and EFs used in the inventory, including clear descriptions of the methodology used for each subcategory.
E.2	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (E.2, 2017) (E.2, 2016) (E.2, 2015) (21, 2013) (44, 2012) Accuracy	Use country-specific EFs for key categories.	Not resolved. Belarus continued to use IPCC default EFs to calculate GHG emissions for key categories under stationary and mobile combustion (see also ID# E.22 below). In addition, the Party reported in CRF table summary 3s1 that it applied a country-specific EF for category 1.B.2 (fugitive emissions from oil and natural gas). The ERT checked the CRF tables and noted that the Party indicated it used country-specific EFs for categories 1.B.2.a.2 (oil production, CH ₄ EF), 1.B.2.a.4 (refining, CH ₄ EF) and 1.B.2.b.2 (gas production, CO ₂ and CH ₄ EFs). However, the ERT noted that the values used as the country-specific EFs are default values from the IPCC good practice guidance (see ID#s E.43 and E.46 below). The ERT also noted that only category 1.B.2.b is a key category under fugitive emissions.
E.3	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (E.4, 2017) (E.4, 2016) (E.4, 2015) (22, 2013) (33, 2012) Transparency	Include in the NIR detailed information on data management and handling.	Addressing. In the NIR (section 3.2.7) Belarus provided some general information on the QA/QC procedures implemented for the energy sector; however, the Party did not provide detailed information on the QC checks it performed relating to data management and handling and emission calculations. The ERT noted that the 2006 IPCC Guidelines (vol. 1, chap. 6) provide guidance on specific QC procedures.
E.4	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (E.5, 2017) (E.5, 2016) (E.5, 2015) (23, 2013) Transparency	Implement QC procedures to ensure the correct and consistent use of notation keys.	Not resolved. The ERT noted that the use of certain notation keys remains inconsistent, as follows: (a) In CRF table 1.A(a)s1, “NO” is reported for category 1.A.1.b (petroleum refining). The correct notation key would be “IE” because the Party reported in its NIR (sections 3.2.2.3 and 3.2.2.4) that AD are aggregated under category 1.A.1.a (public electricity and heat production); (b) In CRF table 1.A(a), AD and emissions for all fuels for categories 1.A.2.b (non-ferrous metals) and 1.A.2.f (non-metallic minerals) are reported as “IE”, but no explanatory information is provided in the NIR, in the documentation box of CRF table 1.A(a)s4 or in CRF table 9 that would allow the ERT verify if the notation key was reported correctly. During the review, Belarus indicated that emissions for categories

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.5	1. General (energy sector) – all fuels –	Include the relevant information on changes made to address	<p>1.A.2.b and 1.A.2.f are reported under category 1.A.2.g.viii (see ID# E.30 below);</p> <p>(c) In CRF table 1.A(a)s4, the notation key “NO” is still reported instead of “IE” for categories 1.A.4.c.ii (off-road vehicles and other machinery) and 1.A.4.c.iii (fishing). No information is included in CRF table 9 (see ID#s E.7 and E.39 below);</p> <p>(d) In CRF table 1.B.2, the use of notation keys is inconsistent: “NA” is used for units, “NO” for AD and “NA” for emissions under category 1.B.2.c.1 (venting). In addition, for category 1.B.2.c.1.i (oil, venting) Belarus reported “NO” for AD and “NA” for emissions although, according to the comment box, emissions were reported under category 1.B.2.c.2.iii (flaring, combined). No explanation is included in CRF table 9 (see ID#s E.7 and E.40 below);</p> <p>(e) In CRF table 1.B.2, Belarus reported “IE” for AD under categories 1.B.2.c.2.i and ii (flaring, oil and gas) and “NA” (instead of “IE”) for CO₂ and CH₄ emissions (see ID# E.41 below);</p> <p>(f) In CRF table 1.B.2, Belarus reported “NO” for CO₂ and CH₄ emissions under category 1.B.2.a.5 (distribution of oil products). The ERT noted that no EFs exist in the 2006 IPCC Guidelines for this category and therefore “NE” should be reported for activities that occur in the country but for which no EFs exist (see ID# E.41 below);</p> <p>(g) In CRF table 1.B.2, Belarus reported “NO” for CO₂ and N₂O emissions under category 1.B.2.a.4 (oil refining). The ERT noted that no EFs exist in the 2006 IPCC Guidelines for this category and therefore “NE” should be reported for activities that occur in the country but for which no EFs exist (see ID# E.41 below);</p> <p>(h) In CRF table 1.A(a)s2, “NE” is reported for CO₂ amount captured for category 1.A.2.f (non-metallic minerals) and 1.A.2.g (other) under subcategories 1.A.2.g.i–viii;</p> <p>(i) Emissions of GHG precursors – NO_x, CO, NMVOC and SO₂ – from stationary and mobile combustion are reported as “NO” in CRF table 1s1 (instead of “NE”). Furthermore, there are still cells without values or correct notation keys (e.g. in CRF table 1s1 for GHG precursors for categories 1.A.2.g (other), 1.A.3.b (road transportation) and 1.A.3.e (other transportation), as well as in CRF table 1s2 for GHG precursors for categories 1.B.2.b (natural gas) and 1.B.2.c (venting and flaring).</p> <p>There is also a lack of transparency regarding the reasons for the changes of notation keys made by the Party for certain categories (see ID# E.8 below).</p>
			Not resolved. NIR sections 3.2.2.3, 3.2.3.3 and 3.6.2.4 provide brief information on the

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	CO ₂ , CH ₄ and N ₂ O (E.23, 2017) (E.31, 2016) (E.31, 2015) Convention reporting adherence	recommendations made in previous review reports, as requested in paragraph 50(i) of the UNFCCC Annex I inventory reporting guidelines.	recalculations performed; however, it is not clear whether the recalculations were implemented as a response to the review process. The NIR did not contain sufficient information on changes made to address recommendations from previous review reports.
E.6	1. General (energy sector) (E.35, 2017) Transparency	Include in the NIR the fuel and energy balance for the most recent inventory years.	Resolved. Belarus included a national energy balance for 2017 in NIR annex 3.
E.7	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (E.36, 2017) Transparency	Provide information in CRF table 9 explaining the reasons for the use of the notation keys “IE” and “NE”.	Not resolved. Belarus did not provide any additional information on completeness in CRF table 9. For example, in response to an issue in the previous review report (see ID# E.37 below), the Party reported “IE” in CRF table 1.A(a)s3 for all subcategories under road transportation, but provided no explanation for the use of “IE” in CRF table 9; the Party reported “IE” for CO ₂ and CH ₄ emissions under category 1.B.2.b.3 (processing, natural gas), which are included in category 1.B.2.b.2 (production, natural gas) according to the comment box, but no explanatory information is included in CRF table 9 or in the NIR; and the Party reported “IE” for categories 1.B.2.c.2.i and ii (flaring of oil and gas), which are included in category 1.B.2.c.2.iii (flaring, combined) (see also item (d) of ID# E.4 above).
E.8	1. General (energy sector) – all fuels – CO ₂ , CH ₄ and N ₂ O (E.36, 2017) Transparency	Provide information in the NIR on the changes made to the notation keys since the previous submission.	Not resolved. Belarus did not provide clear information on changes made to the notation keys since the previous submission. For example, in the 2017 submission, peat used under category 1.A.2.g.i (manufacturing of machinery) was reported as “IE” and in the 2018 and 2019 submissions it was reported as “NO”. During the review, the Party indicated that it will make efforts to provide such information in the NIR.
E.9	1. General (energy sector) – solid fuels – CO ₂ , CH ₄ and N ₂ O (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 resolve data gaps and ensure time-series consistency.	Not resolved. Belarus did not report AD and emissions separated by type of coal, although statistical data are disaggregated by coal type for 2011 onward. The Party has also not applied any splicing techniques to resolve data gaps for before 2011. The ERT noted that Belarus reported consumption of coal to IEA as “other bituminous coal” while in CRF table 1.A(b) all types of coal are reported as “lignite”, which leads to significant differences in the solid fuel data because the calorific value for other bituminous coal is about 70 per cent higher than that of lignite.
E.10	Fuel combustion – reference approach – all fuels – CO ₂ (E.7, 2017) (E.7, 2016) (E.7, 2015) (26, 2013) (35, 2012) Transparency	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach.	Not resolved. Belarus did not provide in the 2019 NIR (section 3.2.1) any additional information on the differences between the sectoral and the reference approach.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
E.11	Fuel combustion – reference approach – all fuels – CO ₂ (E.24, 2017) (E.32, 2016) (E.32, 2015) Comparability	Report the correct units of mass for all fuels in CRF table 1.A(b) and implement QC procedures.	Resolved. Belarus corrected the unit of the AD for consumption of fuel. The reported data on production, imports, exports, international bunkers and stock change are in kt in CRF table 1.A(b).
E.12	Fuel combustion – reference approach – solid fuel – CO ₂ (E.25, 2017) (E.33, 2016) (E.33, 2015) Accuracy	Strengthen the QC procedures and report the correct total amount of CO ₂ emissions from the reference approach by including values for actual CO ₂ emissions from all relevant fuels and the corresponding fraction of carbon oxidized.	Addressing. Belarus reported the correct total amount of CO ₂ emissions for lignite in CRF table 1.A(b). For coke oven/gas coke, the Party still reports the fraction of carbon oxidized as “NO” in CRF table 1.A(b), which results in emissions being reported erroneously as “NO”.
E.13	Fuel combustion – reference approach – all fuels – CO ₂ (E.32, 2017) (E.40, 2016) (E.40, 2015) Accuracy	(a) Treat refinery gas as a secondary fuel; (b) Account for exports of jet kerosene; (c) Account for exports of bitumen; (d) Estimate carbon stored; (e) Provide emission estimates for imports of lignite; (f) Provide emission estimates for imports of coke oven/gas coke; (g) Enhance verification procedures to ensure the consistency of information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d); (h) Include detailed information on the improvements made in the NIR of the next GHG inventory submission.	Addressing. Belarus addressed in the 2017 submission the issues related to refinery gas (item (a)), carbon stored (item (d)) and CO ₂ emissions from imports of lignite (which was previously reported incorrectly because the fraction of carbon oxidized for lignite was reported as “NO”) (item (e)). For item (f), emissions from imported coke oven/gas coke, see ID# E.12 above. In the 2019 inventory submission, the remaining issues to be addressed are items (b, c, g and h) as follows: For item (b), Belarus reported data on jet kerosene exports, but only for 2017 and not for the entire time series (“NO” is reported for the other years of the time series). In addition, the ERT noted that there are inconsistencies regarding the export values of jet kerosene for 2017 between the national energy balance (382 kt oil equivalent (approximately 363 kt) (NIR, annex 3) and CRF table 1.A(b) (562 kt). For item (c), there are no data on bitumen imports, exports and stock changes in CRF table 1.A(b) (although Belarus reported these data to IEA). For item (g), there is inconsistent information in CRF table 1.A(c) because the apparent energy consumption (excluding NEU, reductants and feedstocks) in CRF table 1.A(c) is reported as “NO” for all fuels (see item (d) in ID# E.18 below). For item (h), the Party has not provided information in the NIR on the improvements made in the reference approach related to items (a–g), and there are still other pending issues regarding the consistency of information in the CRF tables (see ID# E.10 above).
E.14	Fuel combustion – reference approach – liquid fuels – CO ₂ (E.41, 2017) Convention reporting adherence	Correct the reporting of AD for jet kerosene imports in CRF table 1.A(b).	Not resolved. There are still some discrepancies between the data for jet kerosene imports between the national energy balance (NIR, annex 3) and CRF table 1.A(b). For 2017, in the CRF table the value reported is 32 kt and in the national energy balance it is 22 kt oil equivalent (approximately 21 kt).

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.15	Fuel combustion – reference approach – other fossil fuels – CO ₂ (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.	Addressing. CRF table 1.A(b) correctly contains a negative value (–28 kt) for stock change for 2017. However, for some previous years (most notably for 2015, 2006, 2004 and 2003) Belarus still reports stock change for peat with the opposite sign. A positive value in the national energy balance should be negative in the CRF table.
E.16	Comparison with international data – all fuels – CO ₂ (E.9, 2017) (E.9, 2016) (E.9, 2015) (28, 2013) (41, 2012) Transparency	Include in the NIR a comparison of the fuel data used in the inventory and the corresponding IEA data, clarifying the reasons for any significant differences.	Resolved. Belarus did not include in the NIR any clarifications on the differences between fuel consumption data used for the emission estimates and data reported to IEA. The Party mentioned during the review that the NCVs used for the inventory are country specific and that IEA applies different values (see ID#s E.17 and E.23 below). The ERT noted that the apparent consumption reported in CRF table 1.A(b) is within 3 per cent of that reported to IEA for 1990 and 2002 and for 2013–2015; and within 13 per cent for 2003–2012. Data for 2017 correspond within 2 per cent. The ERT also noted that in the IEA data comparison performed for the Party’s 2019 submission, there are discrepancies in the AD between the IEA and CRF table 1.A(b): for gas/diesel oil (differences in the values for export and stock change), for crude oil and LPG (stock change reported with opposite sign), for natural gas (differences in the values for production, imports and stock change), and for residual fuel oil and gas oil (differences in the values for imports and exports). During the review, the Party clarified that data used in the inventory are provided by Belstat, and that the Party considers the data to be sufficiently reliable.
E.17	Comparison with international data – liquid fuels, gaseous fuels and other fossil fuels – CO ₂ , CH ₄ and N ₂ O (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 NIR does not include any information on the country-specific NCVs used for residual fuel oil, LPG, natural gas and peat. The ERT noted that, in the IEA data comparison performed for the Party’s 2019 submission, differences in NCVs were observed for natural gas (–1 per cent for 1990–1992 and –3 per cent for 1993–2016), peat (generally +48 per cent in CRF table 1.A(b)) and crude oil (+0.5 per cent in CRF table 1.A(b)). During the review, the Party clarified that the NCVs are based on technical regulations and standardization approved as law in Belarus. Under this law, national State bodies have developed technical codes for common practices. The Ministry of Natural Resources has adopted the following technical codes: a procedure for determining emissions from fuel combustion in boilers with heat release of up to 25 MW (see http://ecoinv.by/images/pdf/tkp_fond/17.09-01-2011.pdf (in Russian)); and rules for calculating emissions for the accounting of implementation measures for energy saving and renewable energy sources (see http://ecoinv.by/images/pdf/tkp_fond/17.09-05-2013.pdf (in Russian)). The Party informed

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.18	Feedstocks, reductants and other NEU of fuels – all fuels – CO ₂ (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).	<p>the ERT that the NCV (in TJ/kt) and carbon content (in kg/TJ) of patent fuel, residual fuel oil and diesel oil were provided for the IPCC Emission Factor Database in accordance with the above-mentioned technical codes. Belarus indicated that it will make efforts to explain in more detail the derivation of the country-specific NCVs in its next submission (see also ID# E.23 below).</p> <p>Addressing. Although Belarus implemented some improvements (as identified in the previous review), there are still some inconsistencies. Belarus reported information in CRF table 1.A(b) on the amount of carbon excluded for crude oil, gas/diesel oil, residual fuels, lignite and natural gas but the following inconsistencies remain:</p> <p>(a) For gasoline, the Party changed the reporting to “NA” in CRF table 1.A(b) but in CRF table 1.A(d) carbon excluded for gasoline is reported;</p> <p>(b) For LPG, the Party reported “NA” in CRF table 1.A(b) for carbon excluded, but with a numerical value being reported in CRF table 1.A(d) for carbon excluded;</p> <p>(c) In CRF table 1.A(d), values of carbon excluded are inconsistent between CRF table 1.A(b) and 1.A(d) for gas/diesel oil (0.83 and 432.87 kt C, respectively), residual fuel (147.53 and 261.37 kt C) and lignite (11.17 and 187.67 kt C);</p> <p>(d) The apparent energy consumption (excluding NEU, reductants and feedstocks) in CRF table 1.A(c) is reported as “NO” for all fuels (see also item (g) of ID# E.13 above);</p> <p>(e) Apparent energy consumption in CRF table 1.A(c) is also inconsistent with that in CRF table 1.A(b);</p> <p>(f) Carbon excluded for BKB and patent fuel is reported as “NO” in CRF table 1.A(b) but a numerical value is reported in CRF table 1.A(d) for carbon excluded;</p> <p>(g) Bitumen is reported as “NO” in CRF tables 1.A(b) and 1.A(d), but emissions from bitumen are reported under the IPPU sector in CRF table 2(I).A-Hs2 (see also item (c) of ID# E.13 above).</p>
E.19	Feedstocks, reductants and other NEU of fuels – all fuels – CO ₂ (E.13, 2017) (E.13, 2016) (E.13, 2015) (32, 2013) (43, 2012) Accuracy	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.	<p>Not resolved. Belarus continues to report “NO” for AD for naphtha lubricants and coal tars used as feedstocks and for non-energy purposes in CRF table 1.A(d). For coal and coke oven coke, there is consumption of these fuels for NEU according to the national energy balance (available at https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/energeticheskaya-statistika/annual-dannye/toplivno-energeticheskie-balansy/ (in Russian)). The NIR does not include any detailed information on the types of fuel used as</p>

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.20	Feedstocks, reductants and other NEU of fuels – crude oil – CO ₂ (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.	<p>feedstock and NEU, or those used as NEU but for which data are lacking. The Party provided neither justification nor documentation showing that these fuels are not used as feedstocks or for NEU in the country (i.e. to justify that the reporting of “NO” is correct). The ERT noted that, although “NO” is reported for lubricants in CRF table 1.A(d), Belarus reported “NE” for lubricants in CRF table 2(I).A-Hs2.</p> <p>Not resolved. Belarus did not recalculate the excluded carbon as required. The values reported for fuel quantity for NEU of crude oil (e.g. 787,456.80 TJ for 2017) and the carbon excluded (15,749.14 kt C) in CRF table 1.A(d) are still much higher than the information provided in the national energy balance for the amount of crude oil in the non-energy sector (176 TJ) (available at https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/energeticheskaya-statistika/annual-dannye/toplivno-energeticheskie-balansy/ (in Russian)). The value reported in CRF table 1.A(d) seems to be closer to the total refinery intake than to the NEU of crude oil. The ERT also noted that the fuel quantity for NEU of crude oil in CRF table 1.A(d) is higher than the apparent consumption reported in CRF table 1.A(b). During the review, Belarus indicated that it will make efforts to resolve the issue in future inventories.</p>
E.21	International aviation liquid fuels – CO ₂ , CH ₄ and N ₂ O (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.	<p>Not resolved. Belarus did not provide detailed and consistent information on the methodology or on the assumption for the allocation of jet kerosene consumption between international and domestic flights. During the review, the Party explained that information about jet kerosene consumption is provided as aggregated data by the Ministry of Transport and Communications. However, the ERT noted that AD and emissions for jet kerosene are reported separately in CRF tables 1.A(b), 1.A(a)s3 and 1.D for the entire time series. The ERT also noted that the AD reported for international bunkers in CRF table 1.A(b) (8,780.75 TJ) are not consistent with the AD reported in CRF table 1.D (5,722.24 TJ), and the memo item in CRF table 1.D shows that the split applied by the Party is 4.01 per cent for domestic aviation and 95.99 per cent for international bunkers for 2017. Belarus clarified that it will make efforts to provide information in the NIR on how jet kerosene is allocated between domestic and international flights.</p>
E.22	1.A Fuel combustion – all fuels – CO ₂ (E.14, 2017) (E.14, 2016) (E.14, 2015)	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels.	<p>Not resolved. Belarus continues to apply IPCC default EFs for all key categories under stationary combustion (see also ID#s E.2 above and E.50 in table 5).</p>

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
	(33, 2013) (44, 2012) Accuracy		
E.23	1.A Fuel combustion – sectoral approach – solid fuels – CO ₂ , CH ₄ and N ₂ O (E.15, 2017) (E.16, 2016) (E.16, 2015) (35, 2013) (45, 2012) Transparency	Explain in more detail the derivation of the country-specific NCVs for solid fuels and provide a justification for their use.	Not resolved. The NIR does not include any information on the country-specific NCVs used for the emission calculations under the sectoral approach. During the review, the Party clarified that NCVs are based on technical regulations and standardization approved as law in Belarus. Under this law, national State bodies have developed technical codes for common practices on the procedures to determine emissions from fuel combustion (see ID# E.17 above). The ERT checked the documents and could not find details on the methodologies used to determine the country-specific NCVs for Belarus (see also ID#s E.26 and E.27 below).
E.24	1.A Fuel combustion – sectoral approach – biomass – CO ₂ (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.	Not resolved. Belarus did not report CO ₂ emissions from biomass in CRF tables 1.A(a)s1 and 1.A(a)s2 and did not report them as a memo item of CRF table 1s2.
E.25	1.A Fuel combustion – sectoral approach – liquid fuels – CO ₂ , CH ₄ and N ₂ O (E.39, 2017) Completeness	Report emissions from refinery gas combustion in all categories where it was used for all years of the time series.	Not resolved. Belarus did not report emissions from refinery gas combustion under categories 1.A.1.a (public electricity and heat production), 1.A.2.c (chemicals) and 1.A.2.g.viii (other) for the entire time series. In addition, there is no clarity as to whether or not refinery gas is considered under category 1.A.5.a (stationary). The NIR does not provide any information on refinery gas consumption for those categories, and, for category 1.A.5.a, it does not have a section explaining AD and EFs used for estimating emissions (see ID# E.58 in table 5). During the review, the ERT asked the Party to confirm the allocation of refinery gas, and Belarus replied that most refinery gas consumption (83 per cent) has been included under category 1.A.2.g.viii (other – liquid fuels). Belarus indicated that it will make efforts to resolve the issue in future inventories.
E.26	1.A Fuel combustion – sectoral approach – all fuels – CO ₂ , CH ₄ and N ₂ O (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).	Not resolved. Belarus did not provide the required information in the NIR. The Party continued to state in the sectoral parts of the NIR (sections 3.2.2.2, 3.2.3.2, 3.2.4.2 and 3.2.5.2) that national data on NCVs were used, without providing any figures or explanation of which national NCVs were applied to which fuels, the values of NCVs (by type of fuel) or the EFs used. During the review, the Party confirmed that all CO ₂ EFs used in the sectoral approach are default values from the 2006 IPCC Guidelines (vol. 2, table 2.2) (see also ID# E.2 above) and provided a table indicating all NCVs and carbon content values used in the inventory, including the country-specific values, as follows: (1) diesel oil (42.58 TJ/unit and 19.55 t C/TJ); (2) residual fuel oil (37.96 TJ/unit and 19.90 t C/TJ); (3) fuel oven household (42 TJ/unit and 20.10 t C/TJ); (4) patent fuel (16.53

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.27	1.A Fuel combustion – sectoral approach – all fuels – CO ₂ , CH ₄ and N ₂ O (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.	<p>TJ/unit and 25.65 t C/TJ); (5) natural gas (33.53 TJ/unit and 16.02 t C/TJ); (6) peat (15 TJ/unit and 21.70 t C/TJ); and (7) refinery gas (49.50 TJ/unit and 15.70 t C/TJ). The ERT could not identify where these country-specific NCVs and carbon content values were applied in the sectoral approach (it seems they were only applied in the reference approach). The NIR does not provide any information on the sources of the NCVs and carbon contents of fuels (see also ID#s E.17 and E.23 above and ID# E.50 in table 5).</p> <p>Not resolved. Belarus explained that it used default EFs for the sectoral approach (see ID# E.2 above). The ERT noted that the country-specific NCVs seemed to be used only for the reference approach, although the Party indicated in the sectoral parts of the NIR that it did apply country-specific NCVs (see ID#s E.26 above and E.50 in table 5). More clarity is needed in the NIR regarding how country-specific NCVs are applied under the sectoral approach. The ERT checked the technical codes for common practices provided by the Party during the review (see ID# E.17 above) and did not find any details on the methodology used to determine the country-specific carbon contents of fuels. See also ID# E.23 above.</p>
E.28	1.A Fuel combustion – sectoral approach – all fuels – CO ₂ , CH ₄ and N ₂ O (E.40, 2017) Transparency	Provide references to the publications where the methodology used for the development of the country-specific parameters (NCVs, carbon contents and EFs) is described in more detail.	Resolved. This issue is considered in ID#s E.17, E.26 and E.27 above.
E.29	1.A Fuel combustion – sectoral approach – all fuels – CO ₂ , CH ₄ and N ₂ O (E.40, 2017) Transparency	Ensure the correct reporting of country-specific carbon contents in CRF table 1.A(b).	Resolved. Belarus provided to the ERT during the review a table indicating all NCVs and carbon contents used in the reference approach (see ID# E.26 above). These values were reported in CRF table 1.A(b).
E.30	1.A.1.b Petroleum refining – all fuels – CO ₂ , CH ₄ and N ₂ O (E.16, 2017) (E.17, 2016) (E.17, 2015) (36, 2013) (46, 2012) Comparability	Reallocate the emissions from petroleum refining to the energy industries category.	<p>Not resolved. Belarus did not reallocate emissions from petroleum refining to category 1.A.1.b and continued to report them as “NO” (instead of “IE”) in CRF table 1.A(a)s1. The Party explained during the review that the AD and emissions for category 1.A.1.b (petroleum refining) for fuels used in the generation of electricity and heat for on-site use are included under category 1.A.1.a (public electricity and heat production) and the correct notation key would be “IE” (see item (a) of ID# E.4 above). The ERT noted that during the previous review, in response to this issue, Belarus had informed the ERT that emissions from petroleum refining were allocated to category 1.A.2.g.viii. Noting the response provided by the Party to ID# E.25 above, which explains that most refinery gas consumption (83 per cent) was included in category 1.A.2.g.viii, and considering that</p>

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.31	1.A.1.c Manufacture of solid fuels and other energy industries – all fuels – CO ₂ , CH ₄ and N ₂ O (E.16, 2017) (E.17, 2016) (E.17, 2015) (36, 2013) (46, 2012) Comparability	Reallocate the emissions from manufacture of solid fuels and other energy industries to the energy industries category.	refinery gas is mainly consumed in petroleum refining, the ERT considers that part of the emissions for category 1.A.1.b are probably allocated under category 1.A.2.g.viii and that more clarity on this will be achieved when the Party resolves the issue in ID# E.25 above. Resolved. This category is not a source in Belarus and therefore the notation key “NO” is correctly reported in CRF table 1.A(a)s1.
E.32	1.A.2 Manufacturing industries and construction – all fuels – CO ₂ , CH ₄ and N ₂ O (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. Belarus disaggregated the emission estimates for categories 1.A.2.a (iron and steel), 1.A.2.c (chemicals), 1.A.2.d (pulp, paper and print), 1.A.2.e (food processing, beverages and tobacco) and 1.A.2.g (other). The emissions for categories 1.A.2.b (non-ferrous metals) and 1.A.2.f (non-metallic minerals) were reported as “IE” and, during the review, the Party indicated that emissions for both of these categories were reported under category 1.A.2.g.viii (see item (b) of ID# E.4 above). However, the ERT noted that the IEA energy balance provides disaggregated fuel consumption for categories 1.A.2.b (non-ferrous metals) and 1.A.2.f (non-metallic minerals), and the national energy balance, which is publicly available on the Belstat website (https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/energeticheskaya-statistika/annual-dannye/toplivno-energeticheskie-balansy/ (in Russian)), provides consumption of fuel for category 1.A.2.f (non-metallic minerals). The ERT also noted that, in the national energy balance, consumption of fuel for category 1.A.2.b is aggregated with that for categories 1.A.2.a (iron and steel) and 1.A.2.g.i (manufacturing of machinery).
E.33	1.A.3 Transport – biomass – CO ₂ , CH ₄ and N ₂ O (E.27, 2017) (E.35, 2016) (E.35, 2015) Accuracy	Reallocate CH ₄ and N ₂ O emissions from biomass in road transportation and railways to category 1.A.4.a (commercial/institutional); apply the correct CH ₄ and N ₂ O EFs for wood/wood waste in the calculations; and estimate and report CO ₂ emissions from biomass use in the corresponding categories, as well as use the correct notation key for CH ₄ and N ₂ O emissions from biomass in road transportation and railways, if this type of fuel is not used in these categories.	Not resolved. Belarus did not reallocate emissions from biomass reported under categories 1.A.3.b (road transportation) and 1.A.3.c (railway) to category 1.A.4.a (commercial/institutional). The ERT noted that the IEFs used for both categories were still 30 kg CH ₄ /TJ and 4 kg N ₂ O/TJ. The ERT also noted that the Party explained during the previous review that biomass reported for road transportation and railways was wood/wood waste used for stationary combustion in institutional buildings. However, the NIR does not provide any information on the type of biomass used in the inventory. The ERT further noted that, in cases where biofuels are used for transportation, the IPCC default EFs for biofuels should be applied and the emissions reported under the transport sector, but in cases where

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.34	1.A.3.b Road transportation – liquid and gaseous fuels – CH ₄ and N ₂ O (E.6, 2017) (E.6, 2016) (E.6, 2015) (24, 2013) Accuracy	Use appropriate CH ₄ and N ₂ O EFs to estimate emissions from road transportation.	<p>biomass is combusted by the stationary sources, the emissions should be allocated to category 1.A.4.a and appropriate EFs (depending on the biomass type) should be applied. During the review, the Party indicated that it will make efforts to resolve this issue in its next submission.</p> <p>Addressing. The ERT noted that CH₄ and N₂O emissions from road transportation is not a key category. Belarus applied the default CH₄ and N₂O EFs for diesel and LPG in accordance with the 2006 IPCC Guidelines (vol. 2, table 3.2.2).</p> <p>For gasoline, the Party used the default value for motor gasoline with oxidation catalyst for the total amount of fuel consumed in road transportation (25 kg CH₄/TJ and 8 kg N₂O/TJ), without providing an explanation in the NIR justifying the assumptions used for the choice of these EFs. The ERT acknowledges that this is a conservative approach and notes that under this category the Party also includes emissions from light-duty vehicles (which have a lower default EF) as well as heavy-duty trucks and buses, and motorcycles (reported as “IE” in CRF table 1.A(a)s3). The ERT notes that not all gasoline-fuelled vehicles are necessarily equipped with catalytic converters and that the default EF for motor gasoline without catalytic converters is higher for CH₄ (33 kg/TJ) and lower for N₂O (3.2 kg/TJ).</p> <p>For natural gas, the EFs applied (1 kg CH₄/TJ and 0.10 kg N₂O/TJ) are not in line with the 2006 IPCC Guidelines defaults (92 kg CH₄/TJ and 3 kg N₂O/TJ).</p>
E.35	1.A.3.b Road transportation – liquid fuels – CO ₂ (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.	Not resolved. Belarus continued to use the default CO ₂ EFs (from the 2006 IPCC Guidelines, vol. 2, table 3.2.1) for estimating emissions for this key category (see ID# E.2 above). The ERT noted that the applied CO ₂ default EF for LPG is actually the default EF for natural gas (see also ID# E.55 in table 5).
E.36	1.A.3.b Road transportation – liquid fuels – CH ₄ and N ₂ O (E.21, 2017) (E.26, 2016) (E.26, 2015) (45, 2013) (53, 2012) Accuracy	Use the correct CH ₄ EF for LPG and revise the N ₂ O emission estimates using appropriate N ₂ O EFs, considering also the possibility of estimating the amount of fuel used by vehicle type and the number of vehicles equipped with catalytic convertors.	Resolved. Belarus applied the correct CH ₄ and N ₂ O default EFs for LPG in CRF table 1.A(a)s3, in accordance with the 2006 IPCC Guidelines (vol. 2, table 3.2.2). A separate issue on the appropriate use of CH ₄ and N ₂ O EFs and the number of vehicles with catalytic converters is discussed in ID# E.34 above.
E.37	1.A.3.b Road transportation – all fuels – CO ₂ (E.26, 2017) (E.34, 2016) (E.34, 2015) Comparability	Make the necessary efforts to provide disaggregated estimates by subcategory under the road transportation category. If this is not possible, use the correct notation keys for all subcategories under road transportation, with the aim of ensuring the transparency of the information given in the CRF tables.	Resolved. Belarus did not provide estimates disaggregated by vehicle category (cars, light-duty trucks, heavy-duty trucks, buses and motorcycles). However, it corrected the notation key and reported “IE” in CRF table 1.A(a)s3 for all subcategories under road transportation.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
E.38	1.A.3.b Road transportation – liquid fuels – CO ₂ (E.42, 2017) Consistency	Ensure that the CO ₂ IEF calculated for the time series is accurate.	Resolved. The CO ₂ IEF for gasoline (69.30 t CO ₂ /TJ) is consistent across the time series.
E.39	1.A.4.c Agriculture/forestry/fishing – all fuels – all gases (E.28, 2017) (E.36, 2016) (E.36, 2015) Transparency	Collect relevant AD to ensure the transparency and comparability of the reporting for this category, and ensure the consistency of the information provided in the NIR and CRF tables by using the correct notation keys, when it is not possible to disaggregate the emissions.	Not resolved. Belarus continued to report emissions for categories 1.A.4.c.ii (off-road vehicles and other machinery) and 1.A.4.c.iii (fishing) under category 1.A.4.c.i (stationary). The Party still incorrectly reported “NO” instead of “IE” for category 1.A.4.c.ii in CRF table 1.A(a)s4. The Party did not provide information in the NIR or in CRF table 9 on the allocation of the emissions for categories 1.A.4.c.ii and 1.A.4.c.iii under category 1.A.4.c.i (stationary) (see also ID# E.7 above).
E.40	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – CH ₄ (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.	Not resolved. The NIR does not include a section on QA/QC procedures describing the QC procedures developed or implemented for category 1.B.2. The reporting of notation keys is inconsistent for category 1.B.2.c.1.i (venting, oil): “NO” is reported for AD and “NA” for emissions, which were included under category 1.B.2.c. 2.iii (flaring, combined) according to the comment box (see item (d) of ID# E.4 above).
E.41	1.B.2 Oil and natural gas and other emissions from energy production – liquid and gaseous fuels – CO ₂ and CH ₄ (E.22, 2017) (E.30, 2016) (E.30, 2015) (47, 2013) Completeness	Collect data to allow the estimation and reporting of all associated emissions.	Resolved. Belarus implemented the recommendation as follows: (a) CO ₂ and CH ₄ emissions for category 1.B.2.b.5 (distribution of natural gas) were reported for the first time in the 2019 submission; (b) Emissions for category 1.B.2.b.3 (processing) were reported as “IE” and included under category 1.B.2.b.2 (production) (see ID# E.7 above); (c) Emissions for categories 1.B.2.c.2.i and ii (flaring of oil and gas) were reported as “IE” and included under category 1.B.2.c.2.iii (flaring, combined) (see ID#s E.4, item (e), and E.7 above); (e) Emissions for categories 1.B.2.a.1 (oil exploration) and 1.B.2.b.1 (gas exploration) are discussed in ID# E.45 below; (d) Emissions for category 1.B.2.a.5 (distribution of oil products) were reported as “NO”. The ERT noted that no EFs exist in the 2006 IPCC Guidelines for this category and therefore these emissions should be reported as “NE” (see ID# E.4, item (f), above); (e) CH ₄ emissions for category 1.B.2.a.4 (oil refining) were reported in CRF table 1.B.2. For CO ₂ and N ₂ O emissions, the ERT noted that no EFs exist in the 2006 IPCC Guidelines for this category and therefore these emissions should be reported as “NE” (see ID# E.4, item (g), above);

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
E.42	1.B.2 Oil and natural gas and other emissions from energy production – liquid and gaseous fuels – CO ₂ and CH ₄ (E.29, 2017) (E.37, 2016) (E.37, 2015) Completeness	Include emission estimates for CO ₂ and CH ₄ from natural gas distribution, and emission estimates of all gases for all subcategories under venting and flaring, as well as for all subcategories under fugitive emissions from oil and natural gas.	(f) For categories 1.B.2.c.1.i and ii (venting of oil and gas), AD were reported as “NO” and CO ₂ emissions as “NA”, but this is because the notation key was used incorrectly (see ID# E.40 above). Emissions for all other fugitive emission categories were estimated appropriately. Resolved. The completeness of reporting on CO ₂ , CH ₄ and N ₂ O emissions for this category is considered under ID#s E.41 above and E.45 below.
E.43	1.B.2 Oil and natural gas and other emissions from energy production – liquid and gaseous fuels – CO ₂ , CH ₄ and N ₂ O (E.29, 2017) (E.37, 2016) (E.37, 2015) Accuracy	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.	Not resolved. The NIR does not provide detailed information on the AD, including how they were derived from the national energy balance, or on the assumptions and methods, or detailed and documented information on the EFs used (e.g. a table indicating the values of the CO ₂ and CH ₄ EFs used, whether default or country specific, and the source of the data) (see also ID#s E.44 and E.49 below). During the review, the Party provided additional information on the AD and EFs (see ID# E.46 below) and the ERT noted that the EFs are not in accordance with the 2006 IPCC Guidelines. The ERT checked the values and for some categories the Party is using EFs (in t gas/m ³) from table 2.16 of the IPCC good practice guidance (chap. 2) and indicating in the CRF tables that it is a country-specific EF (see ID# E.2 above). For example, for category 1.B.2.a.2 (oil production) the Party applied a CH ₄ EF of 0.00145 t CH ₄ /m ³ (IPCC good practice guidance, table 2.16) and indicated its use as a country-specific EF; the default value for this category from the 2006 IPCC Guidelines (vol. 2, table 4.2.5, p.4.60) is 1.96E-02 Gg/10 ³ m ³ oil (calculated as the average of the default weighted total of 2.2E-03 to 3.7E-02 Gg/10 ³ m ³). The same observation is valid for category 1.B.2.a.4 (oil refining), for which the Party applied the upper range value from the Revised 1996 IPCC Guidelines (table 1-58, p.1.121) as a country-specific CH ₄ EF (1,400 kg/PJ); while the default values from the 2006 IPCC Guidelines (table 4.2.4) are 2.6E-06 to 41.0E-06 Gg per 10 ³ m ³ oil refined.
E.44	1.B.2 Oil and natural gas and other emissions from energy production – liquid and gaseous fuels – CO ₂ , CH ₄ and N ₂ O (E.30, 2017) (E.38, 2016) (E.38, 2015) Transparency	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	Not resolved. Belarus did not provide in the NIR detailed and documented information on the methods, AD and EFs used to estimate emissions under category 1.B.2 (see ID#s E.43 above and E.49 below). The Party explained in the NIR (section 3.6.2.4) that recalculations were performed related to oil and gas distribution systems, but there is no clear information on the changes and their impact on

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
		and their impact on total emissions.	total estimated emissions as requested in paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines. The ERT noted that the recalculations were performed for the 2018 submission but without providing the required explanation in the NIR. The recalculations were made to include estimates for category 1.B.2.b.5 (natural gas distributions) (see ID# E.41 above), and estimated emissions for category 1.B.2.b (natural gas) increased from 0.03 to 1.01 kt CO ₂ for 2016.
E.45	1.B.2 Oil and natural gas and other emissions from energy production – liquid and gaseous fuels – CO ₂ and CH ₄ (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 ₂ O from oil and natural gas exploration.	Not resolved. Belarus did not estimate emissions for categories 1.B.2.a.1 (oil exploration) and 1.B.2.b.1 (natural gas exploration), and “NO” was reported in CRF table 1.B.2. The Party did not include in the NIR any information on why the AD for this category were not considered in the inventory. The ERT noted that gas production in Belarus amounted to 205 million m ³ in 2017 according to national statistics (see https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/energeticheskaya-statistika/annual-dannye/toplivno-energeticheskie-resursy/ (in Russian)). According to publicly available information from Belarusneft (see https://www.belorusneft.by/sitebeloil/en/center/exploration/) it is possible that some natural gas exploration activities are occurring in the country.
E.46	1.B.2 Oil and natural gas and other emissions from energy production – oil and natural gas – CH ₄ (E.44, 2017) Accuracy	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.	Not resolved. Belarus did not explain in the NIR the unit used for all categories under 1.B.2 (oil and natural gas). The Party continued to indicate in CRF table 1.B.2 that the units of the AD are PJ and therefore this remains inconsistent with the units of the EF from the 2006 IPCC Guidelines (default EF in Gg per 10 ⁶ m ³ fuel (gas or oil)). The Party explained in the NIR neither how the EFs used for these categories were derived nor the methodology used to convert the EF from Gg per 10 ⁶ m ³ to Gg per PJ. The ERT noted some ambiguous information on the units used (e.g. subcategories 1.B.2.b.4 and 1.B.2.b.5 indicate gas consumed in both PJ and 10 ⁶ m ³). During the review, the Party provided some information to the ERT: (1) the AD under category 1.B.2.a (oil) are in PJ; conversion factor from 10 ³ t to PJ = 0.0423; conversion factor from t to m ³ = 0.872; (2) for category 1.B.2.a.2 (production), CH ₄ EF = 0.00145 t CH ₄ /m ³ and CO ₂ EF = 0.00027 t CO ₂ /m ³ ; (3) for category 1.B.2.a.3 (transport), CH ₄ EF = 0.0000054 t CH ₄ /m ³ and CO ₂ EF = 0.00000049 t CO ₂ /m ³ ; (4) for category 1.B.2.a.4 (refining/storage), CH ₄ EF for oil refining = 1,400 kg CH ₄ /PJ and CH ₄ EF for oil storage = 250 kg CH ₄ /PJ; (5) the AD under category 1.B.2.b.2 (natural gas production) are in PJ and the CH ₄ EF = 0.0029 t CH ₄ /10 ³ m ³ and CO ₂ EF = 0.000095 t CO ₂ /10 ³ m ³ ; and (6) the AD under

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			<p>categories 1.B.2.4 (transmission and storage) and 1.B.2.b.5 (distribution) are in PJ.</p> <p>The Party indicated during the review that it will change the units of the AD to m³ in its next inventory.</p>
E.47	<p>1.B.2.b Natural gas – gaseous fuels – CH₄ (E.18, 2017) (E.21, 2016) (E.21, 2015) (40, 2013) Transparency</p>	<p>Include in the NIR data on the volume of gas transmission (including any transit amounts) to improve transparency.</p>	<p>Not resolved. Belarus did not include in the NIR data on natural gas transmission (including data on transit amounts). The ERT noted that the transit amounts of natural gas transmission (category 1.B.2.b.4) should include the transited quantities through the Yamal–Europe, Northern Lights and Minsk–Kaliningrad natural gas pipelines.</p>
E.48	<p>1.B.2.b Natural gas – gaseous fuels – CO₂ and CH₄ (E.43, 2017) Accuracy</p>	<p>Include in the AD under category 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.</p>	<p>Addressing. The AD reported in CRF table 1.B.2 for categories 1.B.2.b.4 (natural gas transmission and storage) and 1.B.2.b.5 (natural gas distribution) are 19,219 10⁶ m³. According to the previous review report, for category 1.B.2.b.4 the AD are obtained directly from national statistics (total net supply) and the AD for category 1.B.2.b.5 are the amount of gas handled under category 1.B.2.b.4 minus export. As Belarus has no exports, the AD reported in CRF table 1.B.2 are the same for both categories. However, the ERT noted that the AD reported under category 1.B.2.b.4 included only domestic consumption of natural gas and not the transited quantities to other countries (through the Yamal–Europe, Northern Lights and Minsk–Kaliningrad natural gas pipelines) (see ID# E.47 above). The ERT also noted that emissions from natural gas storage were not estimated, but there are three operational underground storage facilities in Belarus (Mozyrskoye, opened in 2008, Osipovichskoye, opened in 1976, and Pribugskoye, opened in 2000).</p>
E.49	<p>1.B.2.b Natural gas gaseous fuels – CO₂ and CH₄ (E.43, 2017) Transparency</p>	<p>Provide detailed information in the NIR on the methodology used for the emission estimates, and justifications for the completeness of the AD.</p>	<p>Not resolved. Belarus did not provide in the NIR detailed information on how AD were calculated and on the methodology applied for categories 1.B.2.b.4 (natural gas transmission and storage) and 1.B.2.b.5 (natural gas distribution). As explained in ID# E.48 above, the Party did not provide a justification for the completeness of the AD for category 1.B.2.b.4 (see also ID#s E.43 and E.44 above).</p>
IPPU			
I.1	<p>2.A.1 Cement production – CO₂ (I.3, 2017) (I.4, 2016) (I.4, 2015) (53, 2013) (62, 2012) Accuracy</p>	<p>Use a higher-tier approach and strengthen efforts to collect plant-specific AD and EFs and use those data to calculate CO₂ emissions from cement production.</p>	<p>Resolved. Belarus recalculated emissions and applied a tier 2 method using as AD the amount of clinker produced and a national EF (NIR section 4.2.1.1, p.44). The EF was calculated taking into account the national data on the content of CaO in clinker in accordance with the 2006 IPCC Guidelines (vol. 3, chap. 2.2.1.2, p.2.12) (see also ID# I.22 in table 5).</p>

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
I.2	2.A.1 Cement production – CO ₂ (I.13, 2017) Transparency	Enhance the clarifying information on trends in AD (and/or EFs) in the NIR, particularly to explain the decrease in AD between 2014 and 2015.	Resolved. Belarus reported information on commissioning of buildings from 2012 to 2017, explaining that the reduction in construction areas between 2014 and 2015 was the cause of reductions in clinker production (NIR section 4.2.1.2, p.43).
I.3	2.A.3 Glass production – CO ₂ (I.15, 2017) Consistency	Ensure the time-series consistency of the emissions 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. Include information in the NIR on data sources and on any changes in order to increase transparency.	Addressing. During the previous review, Belarus recalculated emissions under this category to account for the amount of soda ash, subtracted from category 2.A.4.b (other uses of soda ash) (see ID# I.4 below). The previous ERT found an inconsistency in the ratio of soda ash per mass unit of glass after the Party reallocated soda ash and emissions to category 2.A.3. In fact, the ratio of soda ash per AD of glass (calculated by subtracting the new AD in category 2.A.4.b from the old AD and dividing these values by the AD of glass) was almost constant between 1990 and 2009 (0.15), but diverged after 2010 (0.054–0.10). The Party clarified that the inconsistencies arose because AD for soda ash used in glass production were available only for 1990–2003 and that for after 2003 a surrogate data set was used. During the review, the Party informed the ERT that for the 2019 submission it asked enterprises directly about the volume of production by type of glass according to the IPCC classification (pharmaceutical/laboratory glass, fiberglass, etc.); however, data were obtained only for 2008 onward. The ERT noted that limited information on recalculations was provided in the NIR (section 4.2.3.5, p.48). The ERT recognized that for 2008 onward Belarus improved the quality of the data for this category, including for soda ash used in glass production, but noted that there is no information in the NIR, in response to this recommendation, on how time-series consistency was ensured or on whether a splicing technique was applied for the data on soda ash used in glass production for 2003–2008.
I.4	2.A.4 Other process uses of carbonates – CO ₂ (I.7, 2017) (I.9, 2016) (I.9, 2015) Accuracy	Clarify the activities where soda ash is used and subtract the amount accounted for in other categories (e.g. glass production) from the total soda ash consumed in the country to estimate CO ₂ emissions for this category, avoiding any double counting.	Addressing. The ERT noted that for the 2017 submission Belarus recalculated CO ₂ emissions and subtracted from category 2.A.4.b (other uses of soda ash) the amount of soda ash used for glass production. The amount of soda ash was reallocated to category 2.A.3 (glass production) resulting in a decrease in the AD for category 2.A.4.b from 40.90 to 18.01 kt and in emissions from 16.97 to 7.47 kt CO ₂ between the 2016 and 2017 submissions. However, the Party did not identify the sectors and activities in which soda ash is used with consumption data, or clarify any potential double counting of emissions. The AD reported for this category relate to total consumption of soda ash in the country (NIR, p.49), except the amount used in glass production. Therefore, the accuracy of the

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			CO ₂ estimates for category 2.A.4.b cannot be completely assessed.
I.5	2.A.4 Other process uses of carbonates – CO ₂ (I.7, 2017) (I.9, 2016) (I.9, 2015) Transparency	Describe the activities and sources of emissions from other uses of soda ash, trends and choice of AD in the NIR.	Not resolved. Belarus did not describe the activities and sources of emissions for other uses of soda ash (category 2.A.4.b), trends or choice of AD (see ID# I.4 above).
I.6	2.B Chemical industry – CO ₂ , CH ₄ and N ₂ O (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. Belarus improved the information in the NIR on the reported subcategories under the category chemical industry. For category 2.B.2 (nitric acid production) information is transparent, including a description of the production process. For categories 2.B.4 (caprolactam production), 2.B.7 (soda ash production) and 2.B.8 (methanol and acrylonitrile production), the Party reported AD, EFs and emissions but no information on the production processes was included in the NIR (see sections 4.3.2 (p.53), 4.3.4 (p.55), 4.3.7 (p.56) and 4.3.8 (p.58)).
I.7	2.B.1 Ammonia production – CO ₂ (I.8, 2017) (I.10, 2016) (I.10, 2015) Accuracy	Reconfirm the AD with the ammonia producer, including the amounts of CO ₂ recovery for urea production, revise the estimates of CO ₂ emissions from ammonia production on this basis for the whole time series, using the tier 2 or tier 3 method, and provide in the NIR a description of production process, EFs and AD used.	Not resolved. Belarus explained during the review that the centralized statistical reporting does not provide the information collected on the production of urea separately; only aggregated information on the production of N fertilizer is available. Calculation of the recovered CO ₂ on the basis of urea production data is currently not possible. The Party explained during the review that it is planning to collect data on the amount of the urea produced and the amount of CO ₂ recovered for urea production for country-specific EFs, but this has not yet been done. As the Party has not revised the estimates, a description of the production process, EFs and AD was not provided in the NIR.
I.8	2.B.1 Ammonia production – CO ₂ (I.18, 2017) Consistency	Ensure the QA/QC of recalculations in all categories in the IPPU sector in future submissions in order to avoid inconsistencies between the NIR and CRF table 8.	Resolved. Belarus reflected in CRF table 2(I).A-Hs1 the correct values for CO ₂ emissions. In the 2017 submission, the Party indicated in the NIR that recalculations were performed for this category, but without reflecting the recalculated CO ₂ emissions in the CRF table, which was noted by the previous ERT. The recalculations were due to the use of national parameters (i.e. the lower calorific value of natural gas and the carbon content coefficient for natural gas, instead of the previously used default parameters).
I.9	2.B.1 Ammonia production – CO ₂ (I.16, 2017) Accuracy	Correct the error in the reporting of AD and emissions from ammonia production.	Resolved. The lower CO ₂ EF observed by the previous ERT was because Belarus reported incorrectly the CO ₂ emissions in CRF table 2(I).A-Hs1 (see ID# I.8 above). Belarus has reported the CO ₂ emissions correctly since the 2018 submission and the value of the IEF is 1.97 t CO ₂ /t for the entire time series (default range of 1.67–3.27 t/t).
I.10	2.B.1 Ammonia production – CO ₂	Include information on the time-series applicability of parameters	Resolved. Belarus reported in the NIR (section 4.3.1.2, p.52) that a constant NCV and carbon

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	(I.17, 2017) Transparency	used for estimating the CO ₂ emissions in the NIR.	content factor for natural gas (the same for the entire time series) were applied to estimate the emissions.
I.11	2.B.2 Nitric acid production – N ₂ O (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.	Addressing. Belarus recalculated N ₂ O emissions and applied a tier 2 method. The AD are plant specific and increased from 0.11 to 213.76 kt between the 2017 and 2018 submissions. The ERT noted that the AD reported are now constant for 1990–2016 (213.76 kt), and for 2017 the AD increased to 247.59 kt. Although inconsistencies between 2011 and 2012 no longer occur, the ERT also noted that the value for 2017 seems to be an outlier and needs to be checked by the Party. The plant-specific data were provided by the company for 1990–2016 (NIR, p.55) and there is no clear explanation on how the value for 2017 was obtained or why AD for 1990–2016 are constant (see ID# I.12 below).
I.12	2.B.2 Nitric acid production – N ₂ O (I.19, 2017) Transparency	Include information in the NIR on data sources and on any changes in order to increase transparency.	Addressing. The source of data used to calculate N ₂ O emissions is included in the NIR (section 4.3.2.1, p.55). However, the information is still not completely clear (see ID# I.11 above). During the review, Belarus explained that it uses plant-specific AD for 1990–2016, but no explanation was provided on how the value for 2017 was obtained or why AD for 1990–2016 are constant. In addition, in the NIR the Party makes reference to Belstat as the data provider (which collected information only on the volumes of nitric acid produced as a product) but it is not clear how both sources of data are considered (whether they complement each other, whether they are compared with each other, etc.) in the description of the AD for this category.
I.13	2.B.7 Soda ash production – CO ₂ (I.20, 2017) Consistency	Report the precise AD and emission data in CRF table 2(I).A-Hs1 (previously reported to two decimal places) to avoid the IEF ranging from 0.134 to 0.139 t CO ₂ /t soda ash.	Resolved. Belarus reported the precise AD in CRF table 2(I).A-Hs1, and the IEF is 0.138 t CO ₂ /t soda ash for the entire time series.
I.14	2.C Metal industry – CO ₂ and CH ₄ (I.10, 2017) (I.12, 2016) (I.12, 2015) Transparency	Improve the transparency of the reporting of emission estimates for this category, ensure that the reporting is in full adherence with the UNFCCC Annex I inventory reporting guidelines and include in the NIR and the relevant CRF tables the information provided during the review on the processes for steel production in the country, AD and EFs used.	Resolved. Belarus improved the transparency of the reporting, and categories 2.C.1 (iron and steel production) and 2.C.7 (non-ferrous metal casting) are reported separately in the NIR (sections 4.4.1, pp.64–65, and 4.4.7, pp.67–68). The Party explained that it uses a tier 1 method (because category 2.C is not a key category) and included in the NIR information on metal production processes, EF selection, AD used and the source of the AD. The AD are also reported correctly in CRF table 2(I).A-Hs2. The ERT considers this issue to have been resolved but notes that the AD for non-ferrous metal (category 2.C.7) are reported in NIR table 4.15 (production of ferrous and non-ferrous metals, as well as products from them) in section 4.4.1 (under category 2.C.1), and a cross reference would facilitate review by the next ERT.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
I.15	2.C.1 Iron and steel production – CO ₂ (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. Belarus did not explain in the NIR if the direct reduction iron and cast iron used in steel-making processes were imported or locally produced. During the review, the Party indicated that it plans to collect data on the amount of carbon-containing inputs used from the producers and to integrate the information into the next NIR.
I.16	2.C.1 Iron and steel production – CO ₂ (I.22, 2017) Transparency	Ensure consistency between the NIR and the CRF tables when reporting on recalculations. In case of a recalculation, provide the rationale and assumptions applied to the recalculation in the NIR.	Resolved. Belarus did not recalculate emissions for this category for either the 2018 or the 2019 submission.
I.17	2.D Non-energy products from fuels and solvent use – CO ₂ , CH ₄ and N ₂ O (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.	Not resolved. AD for categories 2.D.1 (lubricant use) and 2.D.2 (paraffin wax use) and the respective CO ₂ emissions were not reported in CRF table 2(I).A-Hs2. The Party stated in its NIR (sections 4.5.1 and 4.5.2) that it is planning to request information from the State customs committee on imports and exports of lubricants and paraffin wax. The ERT noted that Belarus reported “NO” for CH ₄ and N ₂ O emissions under categories 2.D.1 and 2.D.2. The ERT acknowledges that there is no method in the 2006 IPCC Guidelines for estimating CH ₄ and N ₂ O emissions for these categories; however, “NE” should be reported when an activity occurs in the country and the 2006 IPCC Guidelines do not provide a methodology for estimating its emissions or removals (as per footnote 6 of the UNFCCC Annex I inventory reporting guidelines). The Party reported AD for category 2.D.3 (other) and emissions of NMVOCs, CO, NO _x and SO ₂ (although no method for this category is included in the 2006 IPCC Guidelines).
I.18	2.E Electronics industry – HFCs, PFCs, SF ₆ and NF ₃ (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 for why the emissions cannot be estimated.	Addressing. Belarus did not estimate emissions for this category. The Party reported “NE” in CRF tables 2(I)s2 and 2(II) but did not provide information in CRF table 9.
I.19	2.F Product uses as substitutes for ozone-depleting substances – HFCs, PFCs, SF ₆ and NF ₃ (I.4, 2017) (I.6, 2016) (I.6, 2015) (55, 2013) (60, 2012) Completeness	Obtain AD and report emission estimates for all gases.	Not resolved. During the review, Belarus explained that it is still not reporting emissions for this category and that it is planning to assess stocks of HFCs and PFCs for 1995–2018. The results of this research will be included in its next NIR.
I.20	2.G.1 Electrical equipment – SF ₆ (I.26, 2017) Transparency	Provide in the NIR background information to support the country-specific EF for operation.	Resolved. Belarus provided in the NIR (section 4.8.1.2, p.75) background information to support the SF ₆ leakage ratio of 0.5 per cent.
I.21	2.G.1 Electrical equipment – SF ₆	Increase efforts to include emissions from installation and	Not resolved. Emissions from installation and disposal of electrical equipment were not

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	(I.26, 2017) Completeness	disposal of electrical equipment in the next submission.	included in the inventory and the Party continued to provide only operational emissions for this category in CRF table 2(II)B-Hs2. During the review, Belarus explained that AD for estimating emissions from installation and disposal of electrical equipment are currently unavailable.
Agriculture			
A.1	3. General (agriculture) – CO ₂ , CH ₄ and N ₂ O (A.1, 2017) (A.1, 2016) (A.1, 2015) (57, 2013) (67, 2012) Transparency	Continue to take steps to improve the transparency of the inventory for the agriculture sector.	Resolved. The ERT noted that the original recommendation was addressed because the NIR follows the structure outlined in the UNFCCC Annex I inventory reporting guidelines. In particular, the QA/QC and verification and planned improvement sections have been included in the NIR.
A.2	3. General (agriculture) – CO ₂ , CH ₄ and N ₂ O (A.2, 2017) (A.2, 2016) (A.2, 2015) (57, 2013) (68, 2012) Transparency	Provide reference sources for the parameters or factors for which such references are still lacking (e.g. CH ₄ conversion rate for cattle livestock, coefficient corresponding to animal feeding situation (known as Ca) for cattle, weight of swine livestock).	Resolved. Belarus provided references to the relevant source tables from the 2006 IPCC Guidelines in the NIR for the coefficient corresponding to animal feeding situation (known as Ca) for cattle (0.17 and 0.36) (p.92), weight of swine livestock (50 kg) (p.94) and CH ₄ conversion rate (6.5 per cent) for cattle livestock (p.92).
A.3	3. General (agriculture) – CO ₂ , CH ₄ and N ₂ O (A.3, 2017) (A.3, 2016) (A.3, 2015) (58, 2013) (71, 2012) Convention reporting adherence	Follow the procedure described in the IPCC good practice guidance and perform the uncertainty analysis with uncertainty values related to each parameter or factor used in the emission estimation.	Resolved. Belarus followed the procedure described in the IPCC good practice guidance. The Party provided information on the approach used to estimate the uncertainty (NIR, section 5.1.2, p.83). In addition, the Party provided the uncertainty of the AD, parameters and EFs as well as of the emission estimates in the uncertainty section under each category (NIR, sections 5.2.3, 5.3.3, 5.4.3, 5.5.2 and 5.6.2).
A.4	3. General (agriculture) – CH ₄ and N ₂ O (A.9, 2017) (A.10, 2016) (A.10, 2015) Completeness	Report CH ₄ and N ₂ O emissions from asses under enteric fermentation and manure management or, if not estimated, use the notation key “NE”, providing justification for why such emissions have not been estimated in the NIR and in CRF table 9, in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Resolved. Belarus explained in the NIR (section 5.1, p.79) that there are no mules or asses (donkeys) in the country. The Party clarified that data from FAO show an amount of 8,000–9,000 heads but these data do not reflect actual agricultural practices in the country. Therefore, “NO” was reported in CRF tables 3.A, 3.B(a) and 3.B(b).
A.5	3. General (agriculture) – CH ₄ and N ₂ O (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 from the 2006 IPCC Guidelines.	Not resolved. Belarus did not estimate the average annual population of growing animals that are alive for less than a year. During the review, the Party explained that this will be estimated when the appropriate national data are obtained.
A.6	3. General (agriculture) – N ₂ O (A.11, 2017) (A.12, 2016) (A.12, 2015) Comparability	Report typical animal mass values for horses, sheep and goats in CRF table 3.B(a) using the values provided in the NIR instead of using the notation key “NE”.	Resolved. Belarus reported the animal masses for horses, sheep and goats in CRF table 3.B(a).
A.7	3. General (agriculture) – CH ₄ and N ₂ O	Ensure consistency between the cattle categories in NIR tables 5.4, 5.5, 5.7, 5.14, 5.15 and 5.16 used	Resolved. Belarus reported consistently the cattle categorization in NIR tables 5.4, 5.5, 5.7, 5.14, 5.15 and 5.16. In NIR table 5.7, the

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	(A.26, 2017) Transparency	to calculate the N ₂ O and CH ₄ emissions for all subcategories (CRF tables 3.As1, 3.As2, 3.B(a)s1, 3.B(a)s2 and 3.B(b)).	categories “Bulls up to 1 year old”, “Bulls older than 1 year” and “Cows on feed” are reported aggregated as “Young and grown cattle on feed”. The ERT is of the view that Belarus could include a footnote to NIR table 5.7 clarifying the categories included under “Young and grown cattle on feed”.
A.8	3. General (agriculture) – CH ₄ and N ₂ O (A.26, 2017) Transparency	Provide in the NIR a detailed description of the cattle categories used to estimate emissions, ensuring consistency between the CRF tables and the NIR.	Resolved. Belarus reported in NIR table 5.4 (p.88) the correspondence between the national cattle categories and the CRF table categories (dairy cattle and non-dairy cattle). The ERT considers that the names of the cattle categories included in NIR table 5.4 provide an adequate description of the cattle categories.
A.9	3. General (agriculture) – CO ₂ , CH ₄ and N ₂ O (A.27, 2017) Transparency	Include in the NIR references to the data sources of the uncertainty values in all relevant sections where uncertainty values are reported.	Addressing. Belarus included in the NIR references to some data sources used for the uncertainty values (e.g. in sections 5.4.3 and 5.5.2). The ERT noted that no additional information has been included in the NIR since the 2017 submission regarding the uncertainty sources. During the review, the Party clarified that improvements will continue to be made in the next submission. The ERT notes that the current reporting of uncertainty is not complete.
A.10	3. General (agriculture) – CH ₄ and N ₂ O (A.28, 2017) Comparability	Report the AD and emissions for goats and horses under other livestock in CRF tables 3.As1 and 3.B(a)s1, respectively.	Resolved. The Party reported the AD and emissions for goats and horses under categories 3.A.4 and 3.B.4 (other livestock) in CRF tables 3.As1 and 3.B(a)s1.
A.11	3.A.1 Cattle – CH ₄ (A.13, 2017) (A.14, 2016) (A.14, 2015) Transparency	Include in the NIR a comparison analysis of the country-specific EFs and underlying parameters (milk production, weight, etc.) for dairy cattle with IPCC default values and EFs from countries with similar conditions, preferably in tabular format, with explanations of substantial discrepancies identified.	Addressing. The ERT noted that the IEF for enteric fermentation for dairy cattle is higher than the IPCC default (90–128 kg/head/year) for 2009 (128.53), 2015 (128.32), 2016 (129.37) and 2017 (130.95). In response to a recommendation from a previous review report, Belarus provided in its 2017 submission a comparison showing the enteric fermentation EFs used for its dairy cattle and other cattle compared with the IPCC defaults and with countries with similar climatic conditions (table 5.10 of the 2017 and 2019 NIRs). However, Belarus did not provide a comparison analysis of the underlying parameters (milk production, weight, etc.) as requested by the previous ERT to justify the use of a higher country-specific EF for some years of the time series. In response to a question raised during the current review, the Party indicated that information on other parameters will be included in the next NIR.
A.12	3.A.4 Other livestock – CH ₄ (A.4, 2017) (A.4, 2016) (A.4, 2015) (60, 2013) Transparency	Provide in the NIR references for the method employed and the CH ₄ EFs and animal weights used.	Resolved. The Party provided the references for the method employed and the CH ₄ EFs and animal weights for other livestock in the NIR (table 5.9, p.97).
A.13	3.B Manure management – CH ₄ and N ₂ O (A.16, 2017) (A.17,	Make efforts to collect data about the allocation fractions of non-dairy cattle and swine manure per liquid system with and without	Not resolved. Belarus did not provide any information on the allocation fractions of non-dairy cattle and swine manure per liquid system with and without natural crust cover, and has

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	2016) (A.17, 2015) Accuracy	natural crust cover and revise the estimations of CH ₄ and N ₂ O for this category. A well-documented expert judgment or survey results may be used as a data source for manure allocation per liquid system.	not revised the estimations of CH ₄ and N ₂ O emissions. The Party also did not provide a well-documented expert judgment or survey results that could be used as a data source for manure allocation per liquid system.
A.14	3.B Manure management – N ₂ O (A.18, 2017) (A.19, 2016) (A.18, 2015) Accuracy	Report in CRF table 3.B(b) Nex values for all animal species without rounding.	Resolved. Belarus reported unrounded Nex values for all animal species in CRF table 3.B(b).
A.15	3.B Manure management – CH ₄ (A.29, 2017) Transparency	Revise the notation keys used for VS and CH ₄ production potential in CRF table 3.B(a)s1 for fur-bearing animals.	Resolved. Belarus revised the notation key and reported “NA” for VS and CH ₄ production potential in CRF table 3.B(a)s1 for fur-bearing animals as these parameters are not applied in its calculation of CH ₄ emissions.
A.16	3.B Manure management – N ₂ O (A.30, 2017) Accuracy	Use expert judgment, if no AD are available, to develop the necessary input data to estimate indirect N ₂ O emissions from N leaching for manure management, for example by considering data from neighbouring countries with similar climate and MMS.	Resolved. In Belarus, there is no country-specific information on the fraction of N loss due to leaching and run-off from MMS. According to the 2006 IPCC Guidelines (vol. 4, p.10.56), indirect N ₂ O emissions should be assessed in cases where country-specific data on the fraction that is leached are available.
A.17	3.B Manure management – CH ₄ (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)2.	Not resolved. Belarus did not provide information in the NIR on the methodology applied to derive the fractions of manure in the different management systems reported in CRF table 3.B(a)2 on the basis of the information in NIR table 5.15.
A.18	3.B Manure management – CH ₄ (A.31, 2017) Transparency	Provide references for the sources of AD reported in NIR table 5.15.	Resolved. Belarus provided in the NIR (section 5.3.2, p.104) references for the sources of AD reported in NIR table 5.15.
A.19	3.B Manure management – CH ₄ (A.31, 2017) Transparency	Insert the correct values in CRF table 3.B(a)2 so that they are consistent with the values reported in NIR table 5.15.	Not resolved. The ERT could not evaluate whether the values reported in CRF table 3.B(a)2 are consistent with the values included in NIR table 5.15 (p.106) for non-dairy cattle because no explanation was included in the NIR clarifying how the data for storage in solid form were averaged for non-dairy cattle (see ID# A.17 above).
A.20	3.B Manure management – N ₂ O (A.33, 2017) Transparency	Provide details in the NIR on the methodology used to estimate averages of the N content in manure for non-dairy cattle and swine.	Resolved. Belarus provided explanations of the methodology and sources of data used to estimate Nex on the basis of the dry matter in manure in the NIR (section 5.3.2). In addition, the Party corrected the header of NIR table 5.16 to clarify that the average values correspond to 2017.
A.21	3.B Manure management – N ₂ O (A.34, 2017) Transparency	Describe the MMS for all cattle categories in detail, providing references to the sources of the information.	Resolved. Belarus provided the MMS for all cattle categories in NIR table 5.15. In addition, the Party included the source of data and a description of the MMS in the text above NIR table 5.15.
A.22	3.B Manure management – N ₂ O	Apply values for the fraction of volatile N in line with the 2006	Not resolved. The ERT noted that the values reported in NIR table 5.18 for Frac _{GASM} are not

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	(A.34, 2017) Accuracy	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.	consistent with the values reported in CRF table 3.B(b) for total N volatilized as NH ₃ and NO _x under category 3.B.5 (indirect N ₂ O emissions). During the review, Belarus acknowledged that there was an error in the worksheets and incorrect volatilization rates were applied in the calculation of total N volatilized as NH ₃ and NO _x . Belarus indicated that it will revise the worksheets and perform recalculations for the next NIR.
A.23	3.B Manure management – N ₂ O (A.34, 2017) Transparency	Justify the choice of values for the fraction of volatile N 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.	Not resolved. The ERT noted that the choice of the values of fraction of volatile N Frac _{GASM} provided by Belarus in NIR table 5.18 (p.108) was not justified by including references to the appropriate tables in the 2006 IPCC Guidelines. During the review, Belarus explained some of the selections; for example, values for liquid systems for non-dairy cattle are taken from the 2006 IPCC Guidelines (deep bedding in table 10.22). The ERT considers that Belarus should provide transparent information on the exact source (table and MMS considered (row)) for each of the values included in NIR table 5.18. Regarding the references for N loss due to volatilization of NH ₃ and NO _x Frac _{LOSS} from manure management in table 5.25 of the 2017 NIR (applied for calculating volatilized N from agriculture inputs of N under category 3.D.b.1), the ERT noted that Belarus deleted those columns from table 5.25 of the 2019 NIR and did not include the information in another section of the NIR. The ERT considers that transparent information on N loss due to volatilization of NH ₃ and NO _x from manure management should be provided in the NIR, including the values and the rationale for their choice.
A.24	3.B Manure management – N ₂ O (A.34, 2017) Convention reporting adherence	Check the consistency between NIR tables 5.18 and 5.25 and the CRF tables.	Not resolved. See ID#s A.22 and A.23 above.
A.25	3.B.1 Cattle – N ₂ O (A.17, 2017) (A.18, 2016) Convention reporting adherence	Report the correct Nex values for dairy and non-dairy cattle in CRF table 3.B(b) and enhance the QC procedures to ensure the accuracy and consistency of the information reported in the CRF tables and the NIR.	Resolved. Belarus reported the correct Nex values for dairy and non-dairy cattle in CRF table 3.B(b) for the entire time series, and, for 2017, Nex values are in accordance with the values reported in NIR table 5.17 for dairy cattle (77.09 kg N/head) and non-dairy cattle (36.58 kg N/head). The Party explained that QC procedures will continue to be carried out in the future to avoid inconsistencies between the information reported in the CRF tables and the NIR for Nex values.
A.26	3.B.4 Other livestock – CH ₄ (A.15, 2017) (A.16, 2016) (A.16, 2015) Accuracy	Estimate emissions from poultry per subcategory on the basis of statistical data on the country's population structure of poultry. Alternatively, if population structure data are not available, data from the FAO can be used as	Not resolved. Belarus did not provide emission estimates for poultry separated by subcategory (e.g. hens, pullets, other chicken, broilers, turkeys, ducks, geese). During the review, the Party explained that it does not have disaggregated national data on poultry per subcategory and that the population of ducks

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
		a source of information on the populations of ducks and turkeys in Belarus.	according to FAO estimations is available only for 2004 onward. Furthermore, the FAO methodologies are based on the average population of poultry in the region and do not correspond well to the actual national circumstances. The Party informed the ERT that it will make efforts to obtain national data on poultry per subcategory for its next submission.
A.27	3.B.4 Other livestock – N ₂ O (A.20, 2017) (A.21, 2016) (A.20, 2015) Accuracy	Derive typical poultry mass and Nex values per subcategory, using the poultry disaggregation per subcategory recommended in table 10.1 of the 2006 IPCC Guidelines (ducks, turkeys, etc.) and report in CRF table 3.B(b) average typical poultry mass value instead of the notation key “NE”.	Not resolved. Belarus did not disaggregate the poultry categories to derive typical poultry mass and Nex. See ID# A.26 above.
A.28	3.B.4 Other livestock – CH ₄ (A.32, 2017) Transparency	Describe the poultry population in section 5.3 of the NIR on manure storage and use.	Not resolved. The Party described the poultry population in the NIR (section 5.2) but did not include a cross reference in section 5.3.
A.29	3.D Direct and indirect N ₂ O emissions from agricultural soils – N ₂ O (A.35, 2017) Convention reporting adherence	Improve the QA/QC checks of the NIR to ensure that tables are correctly referenced, in particular tables 5.6, 5.7, 5.17 and 5.22.	Resolved. Belarus correctly referenced tables 5.6, 5.7 and 5.17 in the NIR (in the subsection of 5.4.2 titled “Emissions of N ₂ O from grazing” (p.115)). The Party also corrected the reference to tables 11.1 and 11.3 of the 2006 IPCC Guidelines in its NIR (section 5.4.3, p.116) to reflect the source of the uncertainties of the coefficients associated with application of N to soils in category 3.D, and the reference to table 5.22 is not needed anymore. Belarus explained that QC procedures will continue to be carried out in the future to ensure the correct referencing of tables under this category.
A.30	3.D Direct and indirect N ₂ O emissions from agricultural soils – N ₂ O (A.36, 2017) Convention reporting adherence	Provide the reference to the correct table from the 2006 IPCC Guidelines for the uncertainties of the coefficients associated with N loss due to volatilization (i.e. table 11.3).	Resolved. Belarus correctly referenced tables 11.1 and 11.3 of the 2006 IPCC Guidelines in the NIR (section 5.4.3, p.116) to reflect the uncertainties of the coefficients associated with the application of N to soils in category 3.D. Belarus explained that QC procedures will continue to be carried out in the future to ensure the correct referencing of tables under this category.
A.31	3.H Urea application – CO ₂ (A.38, 2017) Transparency	Improve the transparency of the uncertainty values used for urea production by providing the relevant references for the uncertainty value in the NIR in line with the UNFCCC Annex I inventory reporting guidelines.	Not resolved. Belarus did not include the reference to the uncertainty values used for CO ₂ emissions from urea in its NIR (section 5.6.2, p.120).
LULUCF			
L.1	4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (L.1, 2017) (L.1, 2016) (L.1, 2015) (67, 2013) (83, 2012) Completeness	Provide in the NIR and the CRF tables estimates of carbon stock changes and emissions for all mandatory categories.	Addressing. Belarus did not provide any additional estimates of carbon stock changes or emissions for mandatory categories. During the previous review, the Party estimated carbon stock change for deadwood and litter and mineral soils on forest land remaining forest land. In the current submission the Party still reported “NE” for carbon stock change and CO ₂

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			emissions and removals for a number of mandatory categories in CRF tables 4.A, 4.B, 4.C, 4.E and 4.F, including N ₂ O emissions in CRF table 4(III) and CO ₂ , CH ₄ and N ₂ O emissions in CRF table 4(II) (see annex II for a list of the mandatory categories). During the review, Belarus indicated that it will make all efforts to collect data and report them in the next inventory submission.
L.2	4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (L.1, 2017) (L.1, 2016) (L.1, 2015) (67, 2013) (83, 2012) Convention reporting adherence	Provide a consistent uncertainty analysis for each estimated mandatory category.	Not resolved. Belarus did not provide a consistent uncertainty analysis for each estimated mandatory category in the NIR.
L.3	4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (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.	Not resolved. The ERT considers that robust and comprehensive QA/QC procedures were not implemented for the preparation of the inventory because it found several inconsistencies between the NIR and the CRF tables (e.g. see ID# L.5 below and ID#s L.18 and L.19 in table 5).
L.4	4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (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 internal technical review to ensure consistency between the NIR and the CRF tables.	Addressing. Belarus added time frames to the planned improvements reported in the NIR (section 6.1.7, p.143). However, the original issue in the previous review report is for the Party to include in the NIR a detailed plan to assist the ERT in understanding when Belarus intends to implement each improvement mentioned by the Party during the previous review (i.e. estimate all missing categories using at least a tier 1 approach, provide an uncertainty analysis and implement QA/QC procedures for each estimated category, or at least conduct an internal technical review to ensure consistency between the NIR and the CRF tables). See also ID#s L.2 and L.3 above and L.5 below.
L.5	4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (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.	Not resolved. Belarus changed the way information is reported in the NIR and no longer reports the areas of land in table 6.5. Instead, the areas are reported in a new table, which shows the key forest indicators (table 6.6, p.147). The ERT noted that the information on land areas between the NIR and CRF table 4.1 remains inconsistent (see ID# L.12 in table 5).
L.6	Land representation – CO ₂ (L.11, 2017) Transparency	Provide detailed information in the NIR (e.g. in section 6.2) explaining where the land area for “lands under trees and shrubs (plantings)” is represented.	Resolved. Belarus indicated in the NIR (table 6.2, pp.125–126) that land under trees and shrubs (plantings) is considered under category 4.A (forest land). The Party provided additional explanation on shrubs in the NIR (section 6.2, pp.144–146, and table 6.6, p.147).
L.7	Land representation – CO ₂ , CH ₄ and N ₂ O (L.12, 2017) Transparency	Apply the same correlation between country-specific land-use categories and IPCC land-use categories used in table 6.2 to table 6.3 in the NIR.	Resolved. Belarus applied the same correlation used in NIR table 6.2 and updated NIR table 6.3 to reflect the country-specific land-use categories as used in the 2006 IPCC Guidelines (agricultural soils (cropland and grassland), forest land, wetlands, settlements and other land).

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
L.8	4.A.1 Forest land remaining forest land – CO ₂ (L.4, 2017) (L.4, 2016) (L.4, 2015) (70, 2013) Transparency	Increase the transparency of the NIR by including information on the specific definition of growing stock as applied by Belarus and information on the forest types in terms of their age span.	Resolved. Belarus provided the specific definition of growing stock value that it used and information on the forest types in terms of their age span in the NIR (section 6.2.1, pp.147–148).
L.9	4.A.2 Land converted to forest land – CO ₂ and N ₂ O (L.6, 2017) (L.6, 2016) (L.6, 2015) (72, 2013) (89, 2012) Completeness	Improve the completeness and transparency of the reporting on organic soils and 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.	Addressing. Belarus reported the area of organic soils on land converted to forest land (for 2009–2017) for wetlands converted to forest land in CRF table 4.A (in 2017, 197.42 kha) since the 2017 submission. The Party reported “NE” for drainage of wetlands in CRF table 4(II) since its 2015 submission. However, the net carbon stock change in organic soils for this category has not been estimated. The Party still reported “NE” for organic soils for a number of categories (in CRF tables 4.A, 4.B, 4.C, 4.E and 4.F) (see annex II for a list of the mandatory categories). During the review, Belarus indicated that it will make all efforts to collect data and report them in future inventories and to ensure consistency of the information reported in the NIR with data reported in the CRF tables.
L.10	4.B.2 Land converted to cropland – CO ₂ (L.13, 2017) Convention reporting adherence	Include in the inventory improvement plan (section 6.1.7 of the NIR) information on the plan to recalculate the land areas taking into account the 20-year conversion period for land from one category to another.	Resolved. Belarus included in the inventory improvement plan (NIR, section 6.1.7, p.143) the plan to recalculate the land areas taking into account the 20-year conversion period for land from one category to another and indicated the time frame for implementation (i.e. the next inventory).
L.11	4.G Harvested wood products – CO ₂ (L.14, 2017) Completeness	Provide estimates of the annual change in carbon stocks in harvested wood products.	Not resolved. Belarus did not provide estimates of the annual change in carbon stock in harvested wood products. During the review, Belarus indicated that estimates for this category will be presented in the next inventory.
Waste			
W.1	5. General (waste) (W.12, 2017) Transparency	Describe in the NIR the waste management practices used in the country.	Not resolved. Belarus clarified during the review that it will follow the ERT recommendations and include a more detailed description of national waste management practices in the next NIR.
W.2	5.A Solid waste disposal on land – CH ₄ (W.2, 2017) (W.2, 2016) (W.2, 2015) (76, 2013) (94, 2012) Accuracy	Use the IPCC first-order decay method to estimate CH ₄ emissions from solid waste disposal on land.	Not resolved. Belarus did not use the first-order decay method to estimate CH ₄ emissions from solid waste disposal on land in accordance with the 2006 IPCC Guidelines. It still applied the default method from the Revised 1996 IPCC Guidelines to estimate CH ₄ emissions for after 1994 and the surrogate method from the 2006 IPCC Guidelines (vol. 1, equation 5.2) for prior to 1994. During the review, Belarus explained that it does not have the necessary information for the last 50 years to estimate CH ₄ emissions from solid waste disposal on land using the IPCC first-order decay method. The Party clarified that it is planning to estimate emissions for this category using surrogate data for its next submission.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
W.3	5.A Solid waste disposal on land – CH ₄ (W.4, 2017) (W.5, 2016) (W.5, 2015) (79, 2013) (96, 2012) Completeness	Estimate CH ₄ emissions from wastewater sludge.	Not resolved. Belarus explained during the review that, according to national statistics, the data on wastewater sludge are presented in aggregate form, and it is planning to conduct research to determine the composition of each type of sludge. The ERT noted that the Party reported in the NIR (section 7.2.2.6) the planned improvement to identify the scope of sewage sludge disposed at MSW landfills but without indicating the time frame.
W.4	5.A Solid waste disposal on land – CH ₄ (W.4, 2017) (W.5, 2016) (W.5, 2015) (79, 2013) (96, 2012) Transparency	Provide more detailed information in the NIR on the amount of MSW, industrial solid waste and wastewater sludge that is landfilled.	Not resolved. Belarus explained during the review that it will follow the ERT recommendation and present detailed information on the amount of MSW, industrial solid waste and wastewater sludge that is landfilled in the next NIR.
W.5	5.A Solid waste disposal on land – CH ₄ (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”.	Not resolved. Belarus continued to report “NE” for CH ₄ recovery or flaring in CRF table 5.A under categories 5.A.2 and 5.A.3 without explaining the use of this notation key in the NIR or CRF table 9. During the review, the Party explained that “NO” does not reflect the real situation in Belarus. “NE” is reported because emissions do occur but are considered insignificant. The Party indicated that it will provide justification for its reporting of “NE” in future submissions.
W.6	5.A Solid waste disposal on land – CH ₄ (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.	Not resolved. Belarus did not collect and elaborate updated information on MSW historical composition. The Party reported in NIR table 7.3 the same information as in the previous NIR.
W.7	5.A Solid waste disposal on land – CH ₄ (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, enabling also 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. Belarus explained during the review that it will continue working on obtaining sufficient data for estimating CH ₄ emissions from SWDS using the methods in the 2006 IPCC Guidelines.
W.8	5.A Solid waste disposal on land – CH ₄ (W.9, 2017) (W.10, 2016) (W.10, 2015) Accuracy	Improve the QC procedures, choose a correct oxidation factor default value and MCF from the 2006 IPCC Guidelines corresponding with the management practices applicable for the SWDS in Belarus and use these factors correctly for estimating and reporting CH ₄	Not resolved. Belarus reported in the NIR (section 7.2) that, at present, there are no disaggregated data on the amount of waste disposed of at managed or unmanaged MSW landfills for the entire time series. It is planning to collect such data and calculate the corresponding emissions for this category over the next few years. For the latest inventory, all MSW landfills were considered unmanaged.

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
		emissions in the NIR and CRF tables.	
W.9	5.A Solid waste disposal on land – CH ₄ (W.13, 2017) Accuracy	Calculate DOC for the entire time series on the basis of the morphological composition of MSW disposed of at SWDS and revise the CH ₄ emission estimates accordingly.	Resolved. Belarus recalculated the CH ₄ emissions to reflect the revised DOC across the time series in its 2018 submission. The Party explained during the review that DOC values were recalculated according to the data on MSW composition for four time periods, as follows: 0.1673 (for until 2004), 0.1775 (for 2004–2008), 0.2223 (for 2008–2010) and 0.209 (for 2011 onward). The ERT checked the DOC values used in CRF table 5.A and the CH ₄ emissions are calculated accordingly. However, there is a problem of transparency, because the Party reported in the NIR (section 7.2.2.2 and table 7.4) that DOC values were calculated only for two points in time: 1999 (0.1673) and 2011 (0.2089). See ID# W.18 in table 5.
W.10	5.A Solid waste disposal on land – CH ₄ (W.14, 2017) Consistency	Collect and update information on industrial waste generation, using surrogate data or other methods, and estimate CH ₄ emissions from landfilling of industrial waste for the entire time series.	Not resolved. Belarus explained during the review that it will make all efforts to collect (or use surrogate) data to estimate CH ₄ emissions from landfilling of industrial waste for the entire time series. The Party included in its planned improvements (NIR, section 7.2.2.6) the collection and analysis of information on industrial waste landfills but did not indicate the time frame for implementation.
W.11	5.A.2 Unmanaged waste disposal sites – CH ₄ (W.15, 2017) Consistency	Revise and update the MSW generation AD to ensure consistency across the entire time series and revise the CH ₄ emission estimates.	Not resolved. Belarus still uses two sources of AD for estimating CH ₄ emissions and the inconsistency of the time series between 2004 and 2005 remains. The Party performed for the current submission a recalculation for the AD (for the source of data used for 2005 onward) but it was related to a change in the density coefficient (0.18 t/m ³) made by Belstat. After this recalculation, the inconsistency between the two sources of data remained, and the difference in fact increased compared with the previous values: for 2004 and 2005 the AD reported are 3,252.8 and 2,530.4 kt, respectively.
W.12	5.A.2 Unmanaged waste disposal sites – CH ₄ (W.15, 2017) Transparency	Describe in the NIR the MSW generation AD that are used for estimating CH ₄ emissions.	Not resolved. Belarus did not include in the NIR a description of the MSW generation AD used for estimating CH ₄ emissions. The Party did not even mention in the NIR that there are two sources of data or for which years of the time series each one is considered in the calculations.
W.13	5.C.1 Waste incineration – CO ₂ , CH ₄ and N ₂ O (W.1, 2017) (W.1, 2016) (W.1, 2015) (75, 2013) (93, 2012) Completeness	Improve the consistency of the reporting and provide more information in the NIR on the thermal treatment of industrial waste, and estimate any resulting emissions from the thermal treatment of waste and report such emissions in the NIR and the CRF tables.	Addressing. The recommendations regarding providing information in the NIR on the amount and types of waste treated thermally and a table with information on operational facilities have been addressed in the 2017 submission. However, Belarus continues to report “NO” instead of “NE” for emissions from the thermal treatment of waste in CRF table 5.C. Moreover, the ERT noted that the 2006 IPCC Guidelines (vol. 5, chap. 5.4.1, table 5.2) provide default values for parameters related to EFs. The Party reported in the NIR that around 116.74 kt industrial waste (mostly chemical) was incinerated in 2017. The ERT also noted that the

ID#	Issue classification ^{a, b}	Recommendation made in previous review report	ERT assessment and rationale
			<p>Party could apply the tier 1 method for estimating emissions using the available AD – if not for the whole time series, at least for the years for which AD are available. The ERT made a rough estimate and found that CO₂ emissions for 2017 would be 188 kt CO₂ (approximately 0.2 per cent of national total emissions) and therefore above the threshold of significance in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.</p>
W.14	<p>5.D Wastewater treatment and discharge – CH₄ (W.5, 2017) (W.7, 2016) (W.7, 2015) (81, 2013) (99, 2012) Transparency</p>	<p>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”.</p>	<p>Not resolved. During the review, Belarus indicated that detailed information on wastewater treatment systems and discharge pathways will be presented in the next NIR. The Party still reported “NE” in CRF table 5.D and explained in the NIR that it is still necessary to evaluate the possible share of anaerobic wastewater treatment in the country and the CH₄ emissions for this category.</p>
W.15	<p>5.D Wastewater treatment and discharge – CH₄ (W.10, 2017) (W.11, 2016) (W.11, 2015) Transparency</p>	<p>Explore and document the existence of CH₄ for energy recovery and flaring at wastewater treatment plants and, depending on the results obtained, report accordingly in the NIR and CRF tables the CH₄ recovered and/or flared, or use the correct notation key for the domestic and industrial wastewater category.</p>	<p>Not resolved. Additional information on CH₄ recovery and flaring at wastewater treatment plants was not provided in the NIR. The Party reported “NE” in CRF table 5.D but the use of this notation key is not explained in the NIR or in CRF table 9. During the review, Belarus explained that CH₄ energy recovery and flaring facilities at wastewater treatment plants (both industrial and domestic wastewater) do exist in Belarus and therefore “NE” is reported correctly in CRF table 5.D for the amount of gas recovered or flared. The Party also explained that, owing to the different subordination of the biogas complexes (industrial enterprises, Ministry of Communal Services, Ministry of Energy, investors, etc.) it is difficult to collect data for the whole time series. Belarus informed the ERT that it will make all efforts to estimate emissions for this category in accordance with the 2006 IPCC Guidelines.</p>
W.16	<p>5.D Wastewater treatment and discharge – N₂O (W.11, 2017) (W.12, 2016) (W.12, 2015) Accuracy</p>	<p>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 N₂O 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.</p>	<p>Not resolved. During the review, Belarus indicated that it will include a transparent description of wastewater treatment practices in the country and on the activities occurring under this category in the next NIR. The Party provided to the ERT the AD from Belstat on protein intake and country population, and clarified that these will also be presented in the next NIR.</p>
W.17	<p>5.D.2 Industrial wastewater – CH₄ (W.17, 2017) Accuracy</p>	<p>Include wastewater generated by the dairy and sausage industries in the total wastewater outflow and revise the CH₄ emission estimates for industrial wastewater for the entire time series.</p>	<p>Resolved. Belarus included the wastewater generated by the dairy and sausage industries in the total wastewater outflow (under milk products) and revised the CH₄ emission estimates for industrial wastewater for the entire time series. The Party reported the recalculations made in the 2018 NIR: margarine</p>

<i>ID#</i>	<i>Issue classification^{a, b}</i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
			products were excluded from “vegetable oils”, and sunflower, linseed and rapeseed oils were included; dairy products were included in “milk products”; and sausages were added to “meat and poultry”. The Party added to NIR table 7.7 the data on the volumes of the products. For the 2019 submission, the Party also performed a recalculation due to changes in the volumes of wastewater for “petroleum refineries”, “alcohol refining”, “beer and malt” and “wine and vinegar”. Estimated CH ₄ emissions under this category increased for 2015 from 56.82 kt (2017 submission) to 77.24 kt (2018 submission) and 77.29 kt (2019 submission).

^a References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) in which the issue 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 2018 inventory submission of Belarus was not available at the time of the 2019 review. Therefore, the previous recommendations reflected in table 3 are taken from the 2017 annual review report. For the same reason, 2018 is excluded from the list of review years in which the issue could have been identified.

IV. Issues identified in three 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 successive reviews, including the review of the 2019 inventory submission of Belarus, and have not been addressed by the Party.

Table 4

Issues identified in three successive reviews and not addressed by Belarus

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
General		
G.1	Collect AD and estimate emissions for all categories and subcategories which are currently reported as “NE”, but for which the IPCC provides estimation methods	5 (2012–2019)
G.3	Enhance efforts to implement improvements to the inventory by using higher-tier estimation methods and country-specific EFs for key categories, in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF	5 (2012–2019)
G.4	Report in the NIR whether the key category analysis is used in the prioritization of developments in and improvements to the inventory	5 (2012–2019)
G.5	Include in the NIR information on the personnel involved in the development and management of the inventory in order to demonstrate sufficient levels of capacity and expertise to undertake the various tasks and roles within the inventory team	5 (2012–2019)
G.9	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 provide background information on all AD used in the inventory, specifically for the energy and industrial processes sectors	5 (2012–2019)

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
G.10	Provide the missing sections in the NIR following the structure outlined in the UNFCCC Annex I inventory reporting guidelines	4 (2013–2019)
G.15	Put in place robust QA/QC procedures, in particular for the key categories	5 (2012–2019)
G.16	Report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories, and use the information available on internal and external reviews to help develop the section of the NIR that describes the QA/QC procedures undertaken	5 (2012–2019)
G.17	Improve the QC procedures to ensure consistency in the information presented in the CRF tables and the NIR for the different gases and sectors	3 (2015/2016–2019)
G.18	Provide more extensive information on the reasons for observed trends of emissions across the time series at the sectoral level and for the most important categories within these sectors	3 (2015/2016–2019)
G.20	Report CRF tables on recalculations with all the necessary information fully in accordance with the UNFCCC Annex I inventory reporting guidelines and using the agreed tables included in decision 24/CP.19, annex II	3 (2015/2016–2019)
G.21	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	3 (2015/2016–2019)
G.22	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	5 (2012–2019)
Energy		
E.1	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	5 (2012–2019)
E.2	Use country-specific EFs for key categories	5 (2012–2019)
E.3	Include in the NIR detailed information on data management and handling	5 (2012–2019)
E.4	Implement QC procedures to ensure the correct and consistent use of notation keys	4 (2013–2019)
E.5	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	3 (2015/2016–2019)
E.10	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach	5 (2012–2019)
E.12	Strengthen the QC procedures and report the correct total amount of CO ₂ emissions from the reference approach by including values for actual CO ₂ emissions from all relevant fuels and the corresponding fraction of carbon oxidized	3 (2015/2016–2019)

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
E.13	Treat refinery gas as a secondary fuel; account for exports of jet kerosene and bitumen; estimate carbon stored; provide emission estimates for imports of lignite and coke oven/gas coke; enhance verification procedures to ensure the consistency of information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d); and include detailed information on the improvements made in the NIR of the next GHG inventory submission	3 (2015/2016–2019)
E.17	Provide documented information on the country-specific NCVs used in the emission calculations, with the aim of demonstrating the accuracy of those values	3 (2015/2016–2019)
E.18	Ensure consistency across CRF tables 1.A(b), 1.A(c) and 1.A(d)	4 (2013–2019)
E.19	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	5 (2012–2019)
E.21	Provide information in the NIR on how jet kerosene is allocated between domestic and international flights for 2000–2011	5 (2012–2019)
E.22	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels	5 (2012–2019)
E.23	Explain in more detail the derivation of the country-specific NCVs for solid fuels and provide a justification for their use	5 (2012–2019)
E.30	Reallocate the emissions from petroleum refining to the energy industries category	5 (2012–2019)
E.32	Report disaggregated emission data by subcategory under manufacturing industries and construction	5 (2012–2019)
E.33	Reallocate CH ₄ and N ₂ O emissions from biomass in road transportation and railways to category 1.A.4.a (commercial/institutional); apply the correct CH ₄ and N ₂ O EFs for wood/wood waste in the calculations; and estimate and report CO ₂ emissions from biomass use in the corresponding categories, as well as use the correct notation key for CH ₄ and N ₂ O emissions from biomass in road transportation and railways, if this type of fuel is not used in these categories	3 (2015/2016–2019)
E.34	Use appropriate CH ₄ and N ₂ O EFs to estimate emissions from road transportation	4 (2013–2019)
E.35	Use country-specific CO ₂ EFs to estimate emissions for this key category	5 (2012–2019)
E.39	Collect relevant AD to ensure the transparency and comparability of the reporting for this category, and ensure the consistency of the information provided in the NIR and CRF tables by using the correct notation keys, when it is not possible to disaggregate the emissions	3 (2015/2016–2019)
E.40	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	4 (2013–2019)
E.43	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	3 (2015–2019)

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
	for all subcategories under fugitive emissions from oil and natural gas	
E.44	Provide in the NIR detailed and documented information on methods, AD and EFs used in the estimation of emissions, 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	3 (2015–2019)
E.45	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 ₂ O from oil and natural gas exploration.	3 (2015–2019)
E.47	Include in the NIR data on the volume of gas transmission (including any transit amounts) to improve transparency	4 (2013–2019)
IPPU		
I.4	Clarify the activities where soda ash is used and subtract the amount accounted for in other categories (e.g. glass production) from the total soda ash consumed in the country to estimate CO ₂ emissions for this category, avoiding any double counting	3 (2015/2016–2019)
I.5	Describe the activities and sources of emissions from other uses of soda ash, trends and choice of AD in the NIR	3 (2015/2016–2019)
I.6	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	3 (2015/2016–2019)
I.7	Reconfirm the AD with the ammonia producer, including the amounts of CO ₂ recovery for urea production, revise the estimates of CO ₂ emissions from ammonia production on this basis for the whole time series, using the tier 2 or tier 3 method, and provide in the NIR a description of production process, EFs and AD used	3 (2015/2016–2019)
I.17	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	3 (2015/2016–2019)
I.19	Obtain AD and report emission estimates for all gases	5 (2012–2019)
Agriculture		
A.5	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 from the 2006 IPCC Guidelines	3 (2015/2016–2019)
A.11	Include in the NIR a comparison analysis of the country-specific EFs and underlying parameters (milk production, weight, etc.) for dairy cattle with IPCC default values and EFs from countries with similar conditions, preferably in tabular format, with explanations of substantial discrepancies identified	3 (2015/2016–2019)
A.13	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 ₂ O for this category. A well-documented expert	3 (2015/2016–2019)

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
	judgment or survey results may be used as a data source for manure allocation per liquid system	
A.26	Estimate emissions from poultry per subcategory on the basis of statistical data on the country's population structure of poultry. Alternatively, if population structure data are not available, data from the FAO can be used as a source of information on the populations of ducks and turkeys in Belarus	3 (2015/2016–2019)
A.27	Derive typical poultry mass and Nex values per subcategory, using the poultry disaggregation per subcategory recommended in table 10.1 of the 2006 IPCC Guidelines (ducks, turkeys, etc.) and report in CRF table 3.B(b) average typical poultry mass value instead of the notation key "NE"	3 (2015/2016–2019)
LULUCF		
L.1	Provide in the NIR and the CRF tables estimates of carbon stock changes and emissions for all mandatory categories	5 (2012–2019)
L.2	Provide a consistent uncertainty analysis for each estimated category	5 (2012–2019)
L.3	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	5 (2012–2019)
L.9	Improve the completeness and transparency of the reporting on organic soils and 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	5 (2012–2019)
Waste		
W.2	Use the IPCC first-order decay method to estimate CH ₄ emissions from solid waste disposal on land	5 (2012–2019)
W.3	Estimate CH ₄ emissions from wastewater sludge	5 (2012–2019)
W.4	Provide more detailed information in the NIR on the amount of MSW, industrial solid waste and wastewater sludge that is landfilled	5 (2012–2019)
W.5	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"	3 (2015/2016–2019)
W.6	Collect and elaborate updated information on MSW historical composition using all available reference sources from national studies, surveys and results of relevant projects	3 (2015/2016–2019)
W.7	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, enabling also the use of higher-tier methods for estimating CH ₄ emissions from solid waste disposal following the guidance available in the 2006 IPCC Guidelines	3 (2015/2016–2019)

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed^a</i>
W.8	Improve the QC procedures, choose a correct oxidation factor default value and MCF from the 2006 IPCC Guidelines corresponding with the management practices applicable for the SWDS in Belarus and use these factors correctly for estimating and reporting CH ₄ emissions in the NIR and CRF tables	3 (2015/2016–2019)
W.13	Improve the consistency of the reporting and provide more information in the NIR on the thermal treatment of industrial waste, and estimate any resulting emissions from the thermal treatment of waste and report such emissions in the NIR and the CRF tables	5 (2012–2019)
W.14	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”	5 (2012–2019)
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	3 (2015/2016–2019)
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 ₂ O 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	3 (2015/2016–2019)

^a The reports on the reviews of the 2014 and 2018 inventory submissions of Belarus have not yet been published. Therefore, 2014 and 2018 were not included when counting the number of successive years in table 4. As the reviews of the Party’s 2015 and 2016 inventory submissions were conducted together, they are not considered successive and 2015/2016 is considered as one year.

V. Additional findings made during the individual review of the 2019 inventory submission

9. Table 5 contains findings made by the ERT during the individual review of the 2019 inventory submission of Belarus that are additional to those identified in table 3.

Table 5
Additional findings made during the individual review of the 2019 inventory submission of Belarus

<i>ID#</i>	<i>Finding classification</i>	<i>Description of the finding with recommendation or encouragement</i>	<i>Is finding an issue?^a</i>
General			
G.25	QA/QC and verification	<p>The ERT noted that information reported in the NIR is not consistent with CRF table summary 2, as follows:</p> <p>(a) In NIR table 4.1 (section 4.1.1) the total amount of CO₂ eq for the IPPU sector is 6,074.50 kt CO₂ eq, while in CRF table summary 2 it is 6,077.71 kt CO₂ eq. There are discrepancies for the entire time series. There are also discrepancies in the reporting of CH₄ and N₂O emissions between NIR table 4.1 (e.g. 65.50 and 712.22 kt CO₂ eq, respectively, for 2017) and CRF table summary 2 (e.g. 65.42 and 711.00 kt CO₂ eq, respectively, for 2017);</p> <p>(b) There are inconsistencies between the tables of the key category analysis in NIR annex 4 and the total GHG emissions reported by the Party in CRF table summary 2. For example, in table II.4.3 (annex 4) the sum of all categories evaluated in the level assessment for 2017, including LULUCF, is 80,656.03 Gg CO₂ eq, while in CRF table summary 2 it is 80,658.94 kt CO₂ eq; and in table II.4.4 (annex 4) the sum of all categories in the level assessment for 2017, excluding LULUCF, is 93,956.74 Gg CO₂ eq, while in CRF table summary 2 is 93,959.64 kt CO₂ eq. Similar discrepancies can be observed between table II.4.6 (annex 4) for the trend assessment: the total for 1990 (139,368.64 Gg CO₂ eq) does not match the value in CRF table summary 2 (139,274.29 kt CO₂ eq).</p> <p>During the review, the Party explained that the values in the CRF tables are correct and that it will correct the information in the NIR in the next submission.</p> <p>The ERT recommends that Belarus make the values in NIR table 4.1 (under the IPPU sector) and tables II.4.3, II.4.4 and II.4.6 (in annex 4 to the NIR) consistent with the values reported in CRF table summary 2 (including the units) for the entire time series.</p>	Yes. Convention reporting adherence
G.26	QA/QC and verification	<p>Belarus reported information on planned improvements in the sectoral chapters of the NIR for energy (section 3.2.2.4), IPPU (sections 4.2.1.6, 4.2.4.6 and 4.4.7.6), agriculture (sections 5.2.6 and 5.4.6), LULUCF (section 6.1.7) and waste (sections 7.2.2.6, 7.5.1.6 and 7.5.2.5). However, the ERT noted that there is no information on the time frames for the implementation of the improvements, except for the LULUCF sector. The ERT, noting that some recommendations were included in the improvement plan for several years, asked the Party to provide further information on the time frames during the review. The Party indicated that it will include detailed information on the improvement plan in the next inventory submission.</p> <p>The ERT recommends that Belarus report in the NIR on the status of implementation of each planned improvement and on the time frames for implementation.</p>	Yes. Transparency
G.27	NIR	<p>According to paragraph 50(i) of the UNFCCC Annex I inventory reporting guidelines, the NIR shall include information on changes in response to the review process. The ERT noted that Belarus did not include this information in the NIR. During the review, Belarus indicated that it will include this information in the next inventory submission.</p> <p>The ERT recommends that Belarus include information on changes in response to the review process in the next NIR.</p>	Yes. Convention reporting adherence

<i>ID#</i>	<i>Finding classification</i>	<i>Description of the finding with recommendation or encouragement</i>	<i>Is finding an issue?^a</i>
G.28	QA/QC and verification	<p>The ERT noted that some of the information on the methods and EFs used is inconsistent between the NIR and CRF table summary 3. For category 3.B (manure management) the Party reported the use of tier 1 methods for estimating N₂O emissions in CRF table summary 3, but in the NIR (pp.106–108) the Party reported the use of country-specific Nex values and therefore a tier 2 approach was applied. For category 4.D (wetlands) Belarus reported the use of a tier 2 method in CRF table summary 3; however, in the NIR (section 6.5) the Party indicated the use of tier 1.</p> <p>The ERT recommends that Belarus report consistent information on the methods and EFs applied between the NIR and CRF table summary 3 for categories 3.B (manure management) and 4.D (wetlands).</p>	Yes. Convention reporting adherence
Energy			
E.50	Fuel combustion – reference approach – all fuels – CO ₂	<p>In response to a question raised by the ERT regarding ID# E.26 in table 3, the Party provided a table containing the average NCVs and carbon content values used in the reference approach (including the country-specific values) and the default CO₂ EF used in the sectoral approach. The ERT noted that in response to a question from the previous ERT the Party had provided a range of NCVs and carbon contents, in accordance with the technical code of common practice (see http://ecoinv.by/images/pdf/tkp_fond/17.09-05-2013.pdf (in Russian)), for (1) diesel oil (42.44–42.71 TJ/unit and 19.5–19.6 t C/TJ), (2) residual fuel oil (39.64–40.48 TJ/unit and 20.8–21.3 t C/TJ), (3) fuel oven household (41.25–42.35 TJ/unit and 19.9–20.4 t C/TJ), (4) patent fuel (16.59–17.37 TJ/Gg and 27.1 kg/GJ) and (5) natural gas (33.53 TJ/Gg and 15.1 kg/GJ). It was not clear to the ERT how the average values that were applied in the current inventory (see ID# E.26 in table 3) were calculated from the range values from the technical code of common practice.</p> <p>During the review, the Party explained that country-specific carbon contents for some of the fuels were calculated as simple averages from the corresponding fuel varieties described in the technical code of common practice documents, and that all CO₂ EFs used in the sectoral approach are default values from the 2006 IPCC Guidelines (vol. 2, table 2.2). The ERT does not consider the Party's approach to calculating the country-specific carbon content of individual fuels as a simple average of the fuel varieties to be accurate. For example, the Party reported the average carbon content of peat (21.70 t C/TJ) (see ID# E.26 in table 3) by calculating a simple average of sod peat (26.47 t C/TJ), top-layer milled peat (19.60 t C/TJ) and bottom-layer milled peat (19.03 t C/TJ) without considering the actual consumption of individual peat varieties. In addition, the ERT considers that the use of country-specific carbon contents in the reference approach and the use of default EFs in the sectoral approach contributes to discrepancies between the reference and the sectoral approach and is therefore not appropriate. Moreover, considering that the Party should estimate emissions for key categories using higher-tier methods, the country-specific carbon contents can be used to develop country-specific CO₂ EFs.</p> <p>The ERT recommends that Belarus 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). The ERT also recommends that the Party calculate country-specific CO₂ EFs based on the country-specific carbon contents now used in the reference approach and apply them in the sectoral approach.</p>	Yes. Accuracy
E.51	International aviation – liquid fuels – CO ₂	<p>The amount of jet kerosene reported for international bunkers in the reference approach in CRF table 1.A(b) (199.11 kt, equal to 8,781 TJ) is inconsistent with the value reported in CRF table 1.D (5,722 TJ). During the review, Belarus confirmed that this discrepancy is due to a reporting error. Since the total consumption of jet</p>	Yes. Convention reporting adherence

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
		<p>kerosene for domestic and international aviation is 6,358 TJ according to the national energy balance, the reported value in CRF table 1.A(b) is probably overestimated.</p> <p>The ERT recommends that Belarus ensure the consistency of the values reported for jet kerosene under international bunkers between CRF tables 1.A(b) and 1.D.</p>	
E.52	1.A Fuel combustion – sectoral approach – solid and gaseous fuels – CH ₄	<p>Belarus applied a default CH₄ EF of 1 kg/TJ for solid and gaseous fuels to estimate CH₄ emissions under categories 1.A.1 (energy industries), 1.A.2 (manufacturing industries and construction) and 1.A.4 (other sectors). The ERT considers that the default CH₄ EF applied by the Party under category 1.A.1 is appropriate. However, for categories 1.A.2 (for solid fuels) and 1.A.4 (for solid and gaseous fuels) the 2006 IPCC Guidelines (vol. 2, tables 2.3, 2.4 and 2.5, p.2.18) indicate different values for the default CH₄ EFs, as follows: in table 2.3 (manufacturing industries) and table 2.4 (commercial/institutional) the default CH₄ EF for solid fuels is 10 kg/TJ and in table 2.5 (residential and agriculture/forestry/fishing) it is 300 kg/TJ; and for gaseous fuels the default CH₄ EF is 5 kg/TJ for the categories commercial/institutional, residential and agriculture/forestry/fishing. The ERT concludes that CH₄ emissions were underestimated. During the review, the Party acknowledged this finding and explained that the use of the incorrect default EFs is a result of an error that will be corrected in its next submission.</p> <p>The ERT recommends that Belarus recalculate CH₄ emissions under categories 1.A.2 and 1.A.4 by applying the correct default CH₄ EF for solid and gaseous fuels in accordance with tables 2.3, 2.4 and 2.5 of the 2006 IPCC Guidelines (vol. 2). The ERT also recommends that the Party report on the recalculations in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.</p>	Yes. Accuracy
E.53	1.A.2.a Iron and steel – solid fuels – N ₂ O	<p>The N₂O IEF for iron and steel is almost constant across the time series (0.103 kg/TJ for 2001 and 0.127 kg/TJ for 2017), except for 2010, for which it is 1.5 kg/TJ. Noting that the default N₂O EF ranges from 0.1 to 1.5 kg/TJ, the ERT asked the Party if there were any reasons for this outlier for 2010. In response, the Party explained that N₂O emissions from solid fuels in this category comprise the sum of emissions from the main three fuels consumed under this category, which uses the default N₂O EF, as follows: lignite (1.5 kg N₂O/TJ), BKB and patent fuel (1.5 kg N₂O/TJ) and coke oven/gas coke (0.1 kg N₂O/TJ). In 2010, owing to national circumstances, only BKB and patent fuel were consumed and therefore the IEF was 1.5 kg/TJ. The ERT considers that this explanation is reasonable and notes that the EF of 0.1 kg N₂O/TJ refers to coke oven gas.</p> <p>However, Belarus reported in the NIR (section 4.4.1.1) that the technological process of steel production used in the country is smelting of steel in electric arc furnaces. Normally electric arc furnaces are stand-alone plants because of their fundamental reliance on scrap rather than iron as a raw material, although they may be located in integrated plants (2006 IPCC Guidelines (vol. 3, p.4.12)). If this production is at a stand-alone plant there is no source of coke oven gas because coke oven gas is a by-product from coke ovens, which transform coking coal into coke oven coke and coke oven gas at integrated plants. The ERT noted that according to the IEA energy balance and the national energy balance of Belarus, the country only imported coke oven coke and it was the only solid fuel consumed in iron and steel production in 2017. Approximately 40 per cent of the energy used by electric arc furnaces is from natural gas and coal, and the rest is electricity. Therefore the ERT believes that there could have been an underestimation of emissions because the default N₂O EF for coke oven coke is 1.5 kg N₂O/TJ according to the 2006 IPCC Guidelines (vol. 2, table 2.3) and the Party has been applying the default for coke oven gas (0.1 kg N₂O/TJ).</p>	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
E.54	1.A.3.a Domestic aviation – liquid fuels – CO ₂ , CH ₄ and N ₂ O	<p>The ERT recommends that the Party recalculate N₂O emissions by applying the correct EFs in accordance with table 2.3 of the 2006 IPCC Guidelines. The ERT also recommends that the Party report recalculations in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines. The ERT further recommends that Belarus include in the NIR a description of iron and steel production processes, including the types of fuel used for energy purposes.</p> <p>Belarus did not report any consumption of aviation gasoline in CRF table 1.A(a)s3. During the review, the ERT asked the Party whether there are any small aircraft in Belarus (e.g. agricultural planes, leisure aircraft), which consume aviation gasoline. The Party replied that it does not have information on aviation gasoline consumption by small aircraft. However, the ERT considers that this activity is likely to occur in the country and that the Party could discuss with Belstat whether the potential aviation gasoline consumption might be being reported in the national energy balance aggregated with some other type of liquid fuel (i.e. gasoline).</p> <p>The ERT recommends that Belarus 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. If the AD for consumption of aviation gasoline in small aircraft are identified and have not yet been accounted for in the inventory, the ERT recommends that the Party estimate emissions related to the consumption of aviation gasoline.</p>	Yes. Completeness
E.55	1.A.3.b Road transportation – liquid fuels – CO ₂	<p>In CRF table 1.A.(a)s3, Belarus applied the incorrect default CO₂ EF for LPG (56.10 kg/TJ), which is the value for natural gas. The correct default CO₂ EF for LPG is 63.10 kg/TJ according to the 2006 IPCC Guidelines (vol. 2, table 3.2.1). The ERT noted that this is a key category and that, according to ID# E.36 in table 3, the Party should apply country-specific EFs. However, it considers that until the Party updates the EFs using higher tiers, the correct default value for LPG should be applied to avoid underestimation of emissions.</p> <p>The ERT recommends that Belarus apply the correct default CO₂ EFs for LPG (63.10 kg/TJ) according to the 2006 IPCC Guidelines (vol. 2, table 3.2.1) and recalculate CO₂ emissions accordingly. The ERT also recommends that Belarus report the recalculations in the NIR in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.</p>	Yes. Accuracy
E.56	1.A.3.b Road transportation – 1.A.3.c Railways – other fossil fuels – CO ₂ , CH ₄ and N ₂ O	<p>Belarus reported in CRF table 1.A(a)s3 some quantities of other fossil fuels used for road transportation (i.e. 14.06 TJ for 2017). The ERT could not find information in the NIR on the types of fuels considered under other fossil fuels in this category. During the review, the Party explained that lignite and BKB are the fuels included under other fossil fuels and that they are used in category 1.A.3.c (railways) although reported under category 1.A.3.b (road transportation). The ERT noted that the Party reported “NO” for other fossil fuels under category 1.A.3.c. However, the ERT considers that lignite and BKB are most likely used for heating purposes in the railway sector and not for mobile combustion in the transport sector and therefore emissions should be included under category 1.A.4.a (commercial/institutional).</p> <p>The ERT recommends that Belarus verify whether lignite and BKB are used for energy or heating and report on the results in its NIR. In case lignite and BKB are used for energy, the ERT recommends that Belarus reallocate the consumption of these fuels to category 1.A.3.c. In case lignite and BKB are used for heating, the ERT recommends that the Party reallocate the consumption of these fuels used in the railway sector to category 1.A.4.a (commercial/institutional).</p>	Yes. Comparability

<i>ID#</i>	<i>Finding classification</i>	<i>Description of the finding with recommendation or encouragement</i>	<i>Is finding an issue?^a</i>
E.57	1.A.4.a Commercial/ institutional – liquid fuels – CO ₂	<p>The ERT noted that the CO₂ IEF for liquid fuels under category 1.A.4.a (commercial/institutional) increased by 82.7 per cent (from 73.74 t/TJ in 2016 to 134.74 t/TJ in 2017). The IPCC default values range from 63 to 77 t CO₂/TJ, depending on the fuel type. During the review, the Party explained that the value reported for 2017 (134.74 t CO₂/TJ) is wrong due to an incorrect transfer of the inventory’s worksheet data to CRF Reporter.</p> <p>The ERT recommends that Belarus correct the 2017 value of the CO₂ EF for liquid fuels in CRF table 1.A(a)s4.</p>	Yes. Convention reporting adherence
E.58	1.A.5.a Stationary – all fuels – CO ₂ , CH ₄ and N ₂ O	<p>Belarus reported AD and emissions for category 1.A.5.a in CRF table 1.A(a)s4 but the NIR does not contain any information on or a section describing this source activity (see ID# E.25 in table 3). During the review, the Party clarified that all fuels reported in the energy balance as “distribution losses” – including natural gas, peat, firewood, BKB, gasoline, gas/diesel oil, LPG and refinery gas – are allocated under category 1.A.5.a. In checking the fuels reported under this category, the ERT noted that some of these fuels may not be combusted but instead released in the form of fugitive emissions and therefore there is a possible overestimation of emissions. The fuels that are released as fugitive emissions should be accounted (if any) under categories 1.B.2.a (oil) and 1.B.2.b (natural gas).</p> <p>The ERT recommends that Belarus include in the NIR a section to describe the AD, EFs and method applied to calculate emissions under this category. The ERT also recommends that Belarus 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 those fuels are not combusted – particularly for natural gas, which might not be combusted – the ERT recommends that the Party revise the AD and recalculate emissions under category 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)</p>	Yes. Transparency
E.59	1.A.5.b Mobile – all fuels – CO ₂ , CH ₄ and N ₂ O	<p>Belarus reported “NA” for category 1.A.5.b in CRF table 1.A(a)s4. According to the 2006 IPCC Guidelines, emissions from domestic military aviation and navigation should be reported under this category. The NIR does not contain any information or a section describing emissions from military activities. During the review, the Party explained that, according to information provided by Belstat, fuels consumed by domestic military aviation and navigation are included under categories 1.A.3.a (domestic aviation) and 1.A.3.d (domestic navigation).</p> <p>The ERT recommends that Belarus report the correct notation key, “IE”, for AD and emissions for this category in CRF table 1.A(a)s4 and provide explanatory information in CRF table 9 accordingly. The ERT also recommends that the Party include in the NIR a section describing the AD (types of fuels) used in military activities and where emissions are allocated.</p>	Yes. Transparency
IPPU			
I.22	2.A.1 Cement production – CO ₂	<p>In response to a previous recommendation (see ID# I.1 in table 3) Belarus applied the tier 2 method to calculate CO₂ emissions for this category. The Party reported in the NIR (section 4.2.1.2, p.43) that the EF was calculated taking into account the national data on the content of CaO in clinker as provided by the factories. The national value of the CaO content in clinker by mass was used, which varies between 64.83 and 66.35 per cent for 1990–2017. However, from the explanation in the NIR it is not clear how the EFs were derived. According to the 2006 IPCC Guidelines (vol. 3, p.2.12) the derivation of an EF for clinker requires the CaO content of the clinker to be known, as well as the fraction of CaO that was derived from a carbonate source (generally calcium carbonate). During the review, the Party provided to the ERT the annual factory-specific CaO content with data on the production volumes of each factory without explaining how the EFs were derived.</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
I.23	2.B.1 Ammonia production – CO ₂	<p>The ERT recommends that Belarus include in the NIR information on the annual factory-specific CaO content and an explanation of how the national EF for clinker was derived.</p> <p>Belarus applied the tier 2 method to estimate CO₂ emissions for this category. The ERT noted that the description of the methodology applied is not completely transparent in the NIR. The initial step is to determine the total fuel requirement (equation 3.2) to estimate CO₂ emissions (equation 3.3) in accordance with the 2006 IPCC Guidelines (vol. 3, p.3.13). In addition, in the NIR (section 4.3.1.1, table 4.8) the Party reported the amount of ammonia produced as AD instead of reporting the natural gas (total fuel requirement) used as feedstock for the ammonia production, as required by the tier 2 method. The NIR (p.52) refers to the NCV of natural gas and its carbon content factor and therefore the ERT concludes that natural gas is the only fuel used in the production of ammonia. During the review, the Party provided an Excel spreadsheet showing data on the amount of ammonia produced and all parameters used in the calculation of the CO₂ emissions. The ERT noted that the value used as fuel requirement in equation 3.2 (fuel requirement per unit of output for fuel type in GJ/t ammonia produced) is the same value as the NCV (33.53 GJ/t natural gas) reported by the Party in the NIR (section 4.3.1.2, p.54). The ERT concludes that there is an error, because the fuel requirement value is different from the NCV of natural gas.</p> <p>The ERT recommends that Belarus identify the correct value of the fuel requirement per unit of output (in GJ/t ammonia produced) and recalculate the CO₂ emissions for the whole time series. The ERT also recommends that the Party improve the methodological description in the NIR by clarifying the types of fuel used in the production of ammonia (if only natural gas) and the two equations used, including the values of the parameters applied, to estimate CO₂ emissions (equations 3.2 and 3.3 from the 2006 IPCC Guidelines). The ERT further recommends that the Party provide in the NIR (table 4.8) the total fuel requirement of the natural gas used for the production of ammonia.</p>	Yes. Accuracy
I.24	2.C.1 Iron and steel production – CO ₂ and CH ₄	<p>Belarus reported in the NIR that the technological process used for steel production is smelting of steel in electric arc furnaces and that emissions were reported under category 2.C.1.f (other) (NIR, section 4.4.1, p.62). The Party reported “IE” under category 2.C.1.a (steel) in CRF table 2(I).A-Hs2. However, the ERT noted that production in electric arc furnaces is a secondary steel-making process and emissions should be reported under category 2.C.1.a in order to ensure comparability of reporting.</p> <p>The ERT recommends that Belarus report the AD and emissions for electric arc furnaces under category 2.C.1.a (steel).</p>	Yes. Comparability
I.25	2.G.2 SF ₆ and PFCs from other product use – SF ₆ and PFCs	<p>Belarus reported “NO” for SF₆ and PFC emissions for this category in CRF table 2(I)s2. The ERT could not find in the NIR an explanation for this category of why SF₆ and PFC emissions are not estimated in the country. During the review, the Party indicated that the notation key will be changed to “NE” in its next inventory. According to the Party, no research has been conducted on the equipment in the country that contains SF₆ and PFCs and although preliminary requests had been sent to the ministries about SF₆ consumption, only the Ministry of Energy confirmed the use of SF₆ in circuit breakers.</p> <p>The ERT recommends that Belarus estimate SF₆ and PFC emissions for this category. While this is not possible, the ERT recommends that the Party report “NE” for SF₆ and PFCs 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.</p>	Yes. Completeness

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
I.26	2.F.4 Aerosols – HFCs and PFCs	<p>Belarus reported in the NIR (section 4.7, p.74) that HFC and PFC emissions are currently not estimated but that it is planning to estimate them in the future (see also ID# I.19 in table 3). However, “NA” was reported in CRF table 2(I)s2.</p> <p>The ERT recommends that Belarus report the correct notation key, “NE”, for HFC and PFC emissions in CRF table 2(I)s2 and include the necessary explanation in CRF table 9.</p>	Yes. Transparency
Agriculture			
A.32	3.A Enteric fermentation – CH ₄	<p>Belarus reported in the NIR that CH₄ emissions from enteric fermentation for cattle (both dairy and non-dairy) were estimated using a tier 2 method (enhanced characterization method) and therefore the Party calculates CH₄ emissions on the basis of GE intake and MCF. However, the ERT noted that the parameters used for calculating GE are constant along the time series, except for milk yield for dairy cattle. For calculating GE for dairy cattle, Belarus reported in NIR table 5.8 (p.95) a significant increase in milk yield from 1990 to 2017 (8.4–13.5 kg/day), and the ERT noted that these values are slightly different from those reported in CRF table 3.As2. However, 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 remain constant through the time series in NIR table 5.8. The situation is the same for non-dairy cattle. The ERT also noted that the use of constant values for the parameters is not appropriate because it does not take into consideration the changes in the husbandry sector throughout the time series, which are already reflected in the milk yield trend.</p> <p>During the review, Belarus explained that for dairy cattle the high increase in milk yield along the time series reflects improved feeding technologies, improved animal welfare through the updating of existing and construction of new dairy farms, application of an optimal temperature and light regime, and better trained personnel, but no information was provided on how the other parameters could be affected by the improved management on farms.</p> <p>The ERT recommends that Belarus 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.</p>	Yes. Accuracy
A.33	3.B Manure management – CH ₄	<p>The values reported for ash content in manure for cattle (0.16) and swine (0.15) in NIR table 5.14 (p.103) are higher than the default value (0.08) provided in the 2006 IPCC Guidelines (vol. 4, chap. 10, p.10.42). During the review, Belarus explained that the values are based on the norms and standards in force in the territory of Belarus and that the new standard adopted in 2018 confirms the values for ash content in manure. In addition, Belarus explained that the high ash content could be due to the full-concentrated feed of the animals. The ERT noted that full-concentrated feed (e.g. cereals) usually leads to lower ash contents and that the explanation provided by Belarus is not scientifically supported. A proper justification of the country-specific parameters should be provided by the Party based on research, studies or peer-reviewed published literature or on measured data, in accordance with the 2006 IPCC Guidelines (vol. 1, chap. 2.2.4, p.2.12 and 2.15, and vol. 1, chap. 6, p.6.13).</p>	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
A.34	3.B Manure management – CH ₄ and N ₂ O	<p>The ERT recommends that Belarus either apply the default value (0.08) provided in the 2006 IPCC Guidelines and recalculate CH₄ 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.</p> <p>Belarus reported in NIR table 5.15 (p.106) the MMS applied per animal type. Belarus used the same distribution of MMS for each animal type for the entire time series. In the NIR (p.91) Belarus explained that there were important changes in animal husbandry after the collapse of the Soviet Union. The ERT noted that changes in manure management practices are expected over this long period of time given the important changes in the husbandry sector. During the review, the Party explained that the changes that occurred in animal husbandry are related to the animal population and form of ownership, but the MMS did not change.</p> <p>The ERT recommends that Belarus 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.</p>	Yes. Accuracy
A.35	3.B.1 Cattle – CH ₄	<p>The average daily VS excretion for dairy cattle reported by the Party in CRF table 3.B(a)s1 is constant (5.54 kg dry matter/head/day) for the entire time series. The ERT noted that a constant value for VS is not consistent with the changes in GE owing to the increase in milk production mentioned in ID# A.32 above. The Party used a national equation for estimating the VS (equation 5.1, NIR p.103) using a national value for dry matter and ash proportion, both fixed for the entire time series. However, according to the 2006 IPCC Guidelines (vol. 4, chap. 10, p.10.42), country-specific VS excretion rates can be estimated from feed intake levels calculated using the enhanced characterization method (tier 2). Belarus applied the tier 2 method to characterize its cattle population, and the ERT noted that GE of dairy cattle has increased through the time series, from 279.39 MJ/head/day in 1990 to 332.75 MJ/head/day in 2017, owing to the increase in milk yield (NIR table 5.8, p.95). During the review, Belarus explained the reasons for the increase in the milk yield (see ID# A.32 above). However, Belarus did not provide any justification for the lack of variation in the VS parameter.</p> <p>The ERT recommends that Belarus estimate average daily VS excretion for the entire time series, so that the VS 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 in combination with the GE estimated for enteric fermentation.</p>	Yes. Accuracy
A.36	3.B.5 Indirect N ₂ O emissions – N ₂ O	<p>Belarus reported “NE” in CRF table 3.B(b) for N leaching from manure management. The ERT noted that the 2006 IPCC Guidelines (vol. 4, chap. 10, section 10.5.1) do not provide a tier 1 methodology for estimating indirect N₂O emissions from leaching and run-off from manure management, but they do provide a tier 2 methodology that could be used if country-specific information on the fraction of N loss due to leaching and run-off from MMS is available.</p> <p>The ERT encourages Belarus to report indirect N₂O emissions from N leaching from manure management applying equations 10.28 and 10.29 of the 2006 IPCC Guidelines (vol. 4, chap. 10) including reporting the underlying information in the CRF table 3.B(b) and in the NIR.</p>	Not an issue
A.37	3.D Direct and indirect N ₂ O emissions from	<p>Belarus used incorrect headings in NIR table 5.20 for reporting direct N₂O emissions. The heading “Grazing” corresponds to the emissions from crop residues, the heading “Plant residues” corresponds to the emissions from cultivation of organic soils (i.e. histosols), the heading “Mineralization of organic substance” corresponds to the</p>	Not an issue

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
	agricultural soils – N ₂ O	<p>emissions from urine and dung deposited by grazing animals, the heading “Organic soils” corresponds to indirect N₂O emissions from managed soils, and the heading “Indirect emissions” corresponds to total N₂O emissions. During the review, the Party explained that the official version of the NIR (in Russian) is correct and the error is related to a misarrangement in the last two columns of the table in the English version of the NIR. However, the ERT noted that the error is also present in the Russian version of the NIR for the headings “Grazing”, “Plant residues” and “Mineralization of organic substance”.</p> <p>The ERT encourages Belarus to verify and correct, as appropriate, the headings in NIR table 5.20.</p>	
A.38	3.D.a.1 Inorganic N fertilizers – N ₂ O	<p>Belarus reported a time series of N input from application of inorganic fertilizers to cropland and grassland in CRF table 3.D that shows significant peaks and troughs, ranging from 683 kt N in 1990 to 187 kt N in 1995 and to 601 kt N in 2011. The ERT noted that there was no explanation of this trend in the NIR. During the review, Belarus explained that the AD for N applied in inorganic fertilizers are reported by Belstat and the data are considered reliable. In addition, the Party provided an explanation of the trend on the basis of the annual differences in the crops planted and the economic situation of agriculture. The ERT agreed that the explanation provided could explain the trend in the application of inorganic fertilizers to cropland and grassland.</p> <p>The ERT recommends that Belarus provide in the NIR an explanation of the trend in the N input from application of inorganic fertilizers to cropland and grassland.</p>	Yes. Transparency
LULUCF			
L.12	4.A Forest land – CO ₂ , CH ₄ and N ₂ O	<p>The total forest land areas reported in the NIR and CRF table 4.1 are still inconsistent (see ID# L.5 in table 3). During the review, the Party clarified that the inconsistency between the areas reported in NIR table 6.6 (8.2 million ha) and CRF table 4.1 (9.6 million ha) arose because the value in the CRF table includes areas of forest land and non-forest land (that is intended to be restored) located within the boundaries of the Forest Fund, provided for forest management. The area reported in NIR table 6.6 only relates to the area of forest land.</p> <p>In response to a question raised by the ERT on clarifying why the total forest area of the Forest Fund (9.6 million ha) is reported in CRF table 4.1 whereas only forest land area for the needs of forestry (8.6 million ha) is reported in the NIR, Belarus explained that the State Property Committee, on the basis of departmental reporting forms, provides a table on the redistribution of land by type to create the land-transition matrix for categories of land use. This information is collected as a whole for the entire country (as reported in CRF table 4.1). In contrast, forest land in Belarus is assigned to different departments within various government bodies (as indicated in NIR table 6.5) and the AD necessary for estimating carbon flows are available only for territories assigned to the Ministry of Forestry (NIR table 6.6). According to the Party, it is not possible to calculate carbon fluxes for the entire territory of the country, or to create a land-transition matrix only for forest land under the responsibility of the Ministry of Forestry. The ERT commends the Party for this explanation; however, the ERT considers that the explanation above should be included in the NIR to clarify the difference between the areas reported in CRF table 4.1 and NIR table 6.6. The ERT also considers that to make the reporting of the areas consistent across the NIR and the CRF tables, an additional table should be provided in the NIR showing the total area of forest in the country, as reported in CRF table 4.1, separated into forest land and non-forest land, and showing the areas of forest under the Ministry of Forestry for which carbon fluxes are calculated as in NIR table 6.6.</p> <p>The ERT recommends that Belarus include in the NIR the explanation provided during the review as well as an additional table showing the total area of forest in the country, as reported in CRF table 4.1, separated into forest</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
		land and non-forest land, and the areas of forest managed under the Ministry of Forestry for which carbon fluxes are calculated.	
L.13	4.A.1 Forest land remaining forest land – CO ₂	<p>Belarus reported the area of organic soils on forest land remaining forest land as “NE” in CRF table 4.A. However, the net carbon stock change in organic soils in this category was reported as “IE” in the same CRF table. The ERT noted that the reporting of the notation keys is not consistent, and that no information was included in the NIR or in CRF table 9 to explain the reporting of “IE” for net carbon stock change in organic soils. During the review, Belarus explained that “NE” should be reported for net carbon stock change in organic soils instead of “IE”. The Party confirmed that it will correct the notation key in the next inventory. The ERT noted that, in accordance with ID# L.1 in table 3, the Party is recommended to estimate emissions for all mandatory categories.</p> <p>The ERT recommends that Belarus correct the notation key from “IE” to “NE” for net carbon stock change in organic soils on forest land remaining forest land in CRF table 4.A and include explanation of the use of “NE” in CRF table 9.</p>	Yes. Comparability
L.14	4.A.1 Forest land remaining forest land – CO ₂	<p>During the review, the ERT identified outliers in CRF table 4.A for net carbon stock change in litter for 2017 and for net carbon stock change in deadwood for 2016. For net carbon stock change in litter, the trend across the time series is consistent for 1990–2016; however, it decreased by 40 per cent between 2016 (608.15 kt C) and 2017 (368.92 kt C). For net carbon stock change in deadwood an outlier can be observed for 2016 (554.7 kt C), which is clearly different from the values for 2015 (375.68 kt C) and 2017 (345.44 kt C). In response to a question raised by the ERT, Belarus explained that the outliers observed in litter and deadwood are due to an error made when calculating the area of land under different types of trees. The Party explained that for the decrease in the stock change in litter between 2016 and 2017, the area of land for the category other forests was underestimated almost twofold in 2017; and for the outlier in 2016 for the stock change in deadwood the Party indicated that the area of land for the category other forests was overestimated in 2016.</p> <p>The ERT recommends that Belarus verify the reasons for the outliers and correct the values of net carbon stock change in litter for 2017 and net carbon stock change in deadwood for 2016 and report the correct CO₂ emissions for this category in CRF table 4.A.</p>	Yes. Accuracy
L.15	4.A.2.3 Wetlands converted to forest land – CO ₂	<p>Belarus reported “NE” for area of mineral soils under wetlands converted to forest land in CRF table 4.A. However, mineral soils in wetlands do not occur. During the review, the Party explained that “NE” will be replaced by “NO” in the next submission.</p> <p>The ERT recommends that Belarus apply the correct notation key, “NO”, for area of mineral soils for wetlands converted to forest land in CRF table 4.A in the next submission.</p>	Yes. Comparability
L.16	4.B.1 Cropland remaining cropland – CO ₂	<p>Belarus calculated net carbon stock change in organic soils using the EF for cultivated organic soils (1 t C/ha/year) (NIR, section 6.3.3, p.175). The ERT noted that the EF used by Belarus is lower than the default EF (5 t C/ha/year) for cultivated organic soils in the 2006 IPCC Guidelines (vol. 4, chap. 5, table 5.6, p.5.19). During the review Belarus explained that the EF of 1 t C/ha/year is used in accordance with the IPCC good practice guidance for LULUCF (chap. 3, table 3.3.5, p.3.79). However, the ERT considers that Belarus should apply the EF provided in the 2006 IPCC Guidelines unless Belarus can justify the use of the current EF as being country-specific due to national circumstances.</p>	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
L.17	4.C.1 Grassland remaining grassland – CO ₂	<p>The ERT recommends that Belarus 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 its next NIR. If a recalculation is performed, the ERT recommends that Belarus provide in the NIR relevant information on the recalculation in accordance with paragraphs 43–45 of the UNFCCC Annex I inventory reporting guidelines.</p> <p>Belarus reported carbon stock change in living biomass and dead organic matter in grassland remaining grassland as “NE” in CRF table 4.C. However, in the NIR (section 6.4, pp.176–177) the Party reported that it is using the tier 1 method from the 2006 IPCC Guidelines, in which it is assumed that the net change in carbon stock in living biomass and dead organic matter in grassland is zero. The ERT noted that, according to a recommendation from the 16th meeting of GHG inventory lead reviewers, “NA” should be reported in CRF tables for the tier 1 assumption provided in the 2006 IPCC Guidelines for carbon stocks in equilibrium in the LULUCF sector. During the review, Belarus explained that “NE” will be replaced by “NA” in the next inventory. In addition, the ERT noted that the explanation in the NIR is not completely correct. The Party reported in the NIR (section 6.4) under “changes of the carbon content in dead biomass” that, according to the tier 1 and 2 methods, it is assumed that the net change in carbon stocks in dead biomass of grassland is zero. However, carbon stock is zero only under the tier 1 method (2006 IPCC Guidelines, vol. 4, chap. 5, section 6.2.2.1, p.6.11).</p> <p>The ERT recommends that Belarus apply the correct notation key, “NA”, for carbon stock change in living biomass and dead organic matter in grassland remaining grassland and provide in the NIR a correct description of the method used under “changes of the carbon content in dead biomass”.</p>	Yes. Comparability
L.18	4.D.1.1 Peat extraction remaining peat extraction – CO ₂ and N ₂ O	<p>Belarus reported in NIR table 6.24 (pp.177–178) the CO₂ and N₂O emissions for category 4.D.1.1. The ERT noted that for 2017 the CO₂ emissions reported in the NIR (6.776 Gg CO₂) do not match the value reported in CRF table 4.D (9.57 kt CO₂), although the AD (total area of organic soils) are the same (9,237.7 ha). The ERT also noted that, although N₂O emissions for this category were reported in the NIR for the entire time series (e.g. 0.0015 Gg N₂O for 2017), Belarus reported “NE” in CRF table 4(II) under category 4.D.1 (peat extraction lands – drained organic soils).</p> <p>During the review, Belarus explained that the EF applied to calculate CO₂ emissions under this category (net carbon stock change in soils per area) was incorrectly uploaded to CRF table 4.D (0.28 t C/ha) for 2017 and that the default EF (0.2 t C/ha for nutrient-poor soils) provided in the 2006 IPCC Guidelines (vol. 4, chap. 7, table 7.4, p.7.13), which was applied for the other years of the time series, should have been used. Regarding N₂O emissions, the Party confirmed that these were not reported in CRF table 4(II) and explained that N₂O emissions reported in the NIR were calculated using the IPCC good practice guidance for LULUCF (appendix 3a.2, table 3a.2.1, p.3.275) with the N₂O EF of 0.1 kg N₂O-N/ha/year (for nutrient-poor organic soils).</p> <p>However, the ERT noted that in accordance with the 2006 IPCC Guidelines (vol. 4, chap. 7, table 7.6, p.7.16) the default N₂O EF for this category is considered negligible for nutrient-poor organic soils and therefore N₂O emissions for this category do not need to be estimated. Belarus should report the notation key “NA” in CRF table 4(II) for this category instead of “NE”.</p> <p>The ERT recommends that Belarus apply the correct EF (0.2 t C/ha) to estimate CO₂ emissions for 2017. The ERT also recommends that the Party report N₂O emissions in accordance with the 2006 IPCC Guidelines. In addition, the ERT recommends that Belarus ensure the consistent reporting of N₂O emissions between the NIR and CRF</p>	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
L.19	4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O	<p>tables and report the notation key “NE” in CRF table 4(II) under category 4.D.1 (peat extraction lands – drained organic soils), together with a justification for not including the emissions in the NIR and CRF table 9.</p> <p>The AD reported in CRF table 4(V) for biomass burning under forest land remaining forest land were nine times higher for 2016 (252,363,230 kg dry matter) than for 2017 (27,958,810 kg dry matter). However, the total area of forest fires reported in NIR table 6.13 and figure 6.1 for 2016 is small (250.9 ha) and is more than double the 2017 value (106.6 ha). During the review, Belarus explained that an error was made when entering AD for 2016 in CRF table 4(V).</p> <p>The ERT recommends that Belarus correct the AD for 2016 and report the correct emissions in CRF table 4(V) for biomass burning on forest land remaining forest land.</p>	Yes. Accuracy
Waste			
W.18	5.A Solid waste disposal on land – CH ₄	<p>In response to a previous recommendation (see ID# W.9 in table 3) Belarus explained that DOC values were recalculated for four time periods: 0.1673 (for until 2004), 0.1775 (for 2004–2008), 0.2223 (for 2008–2010) and 0.209 (for 2011 onward). The ERT checked the DOC values used in the inventory in the CRF tables and found that the CH₄ emissions had been calculated accordingly. However, the Party did not update the NIR to reflect the new methodology applied for the determination of the DOC values. The explanation in NIR table 7.4 and in the text above the table still explains that DOC values were calculated only for two points in time: 1999 (0.1673) and 2011 (0.2089). The ERT considers that Belarus should update the waste estimates to use the first-order decay method (see ID# W.2 in table 3), but, while that is not possible, the Party should include in the NIR the correct explanation of the methodology used to derive the DOC values used in the inventory.</p> <p>The ERT recommends that Belarus describe in the NIR the correct methodology used to determine the DOC values.</p>	Yes. Convention reporting adherence
W.19	5.B Biological treatment of solid waste – CH ₄ and N ₂ O	<p>Belarus reported biological treatment of solid waste as “NO” in CRF table 5.B. However, the NIR mentions that there is a mechanical–biological plant for processing up to 100 kt MSW but the technology used is not known. During the review, the Party confirmed that the plant is in operation, and although at present the national inventory team does not have the legal basis to collect the necessary information at the plant level, it plans to collect sufficient data to estimate emissions from the biological treatment of solid waste.</p> <p>The ERT considers that reporting “NO” is not in line with the UNFCCC Annex I inventory reporting guidelines. Moreover, on the basis of information provided by the Party, especially regarding the capacity of the above-mentioned plant (100 kt), the ERT believes that it is possible to roughly estimate the CH₄ and N₂O emissions using the default EFs from table 4.1 of the 2006 IPCC Guidelines (vol. 5, chap. 4.1.3.1). For example, the ERT applied the default EFs from this table for composting and anaerobic digestion, and emissions ranged from 2 to 17 kt CO₂ eq depending on the technology used. These values correspond to approximately 0.02 per cent of the total CO₂ eq emissions and are therefore below the threshold of significance in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.</p> <p>The ERT recommends that Belarus either implement its 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</p>	Yes. Completeness

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? ^a
W.20	5.D.1 Domestic wastewater – CH ₄	<p>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.</p> <p>CH₄ emissions from domestic wastewater were reported as “NE”. In the NIR the Party explained that the main method of municipal wastewater treatment is biological treatment under aerobic conditions; therefore, CH₄ emissions are practically zero. However, it was not clear to the ERT whether uncollected wastewater was also taken into consideration. During the review, the Party informed the ERT that 6.4 per cent of households are not connected to municipal sewer systems. The ERT noted that uncollected wastewater treated on site (e.g. in septic tanks or latrines) might result in CH₄ emissions and there is guidance in the 2006 IPCC Guidelines (tier 1 method provided in vol. 5, chap. 6.2) on how to estimate them. For example, using the AD provided by the country (6.4 per cent of the population of 9.5 million) with country-specific per capita biological oxygen demand used by Belarus (60 g/person/day), and applying the default MCF value for septic systems (0.5) from table 6.3 of the 2006 IPCC Guidelines, the estimate calculated by the ERT was 3.99 kt CH₄.</p> <p>The ERT recommends that Belarus estimate CH₄ emissions from domestic wastewater treated on site and not connected to municipal sewer systems.</p>	Yes. Completeness

^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 for Belarus for submission year 2019, as submitted by Belarus

Table 1 shows total GHG emissions, including and excluding LULUCF and, for Parties that have decided to report indirect CO₂ emissions, with and without indirect CO₂. Tables 2–3 show GHG emissions reported under the Convention by Belarus by gas and by sector, respectively.

Table 1
Total greenhouse gas emissions for Belarus, 1990–2017
 (kt CO₂ eq)

	<i>Total GHG emissions excluding indirect CO₂ emissions</i>		<i>Total GHG emissions including indirect CO₂ emissions^a</i>	
	<i>Total including LULUCF</i>	<i>Total excluding LULUCF</i>	<i>Total including LULUCF</i>	<i>Total excluding LULUCF</i>
1990	118 169.33	139 274.29	NA	NA
1995	54 771.49	83 681.00	NA	NA
2000	47 998.11	81 240.87	NA	NA
2010	53 639.48	93 765.87	NA	NA
2011	55 800.98	93 378.27	NA	NA
2012	62 243.10	94 271.16	NA	NA
2013	60 242.00	95 363.61	NA	NA
2014	64 479.93	94 587.90	NA	NA
2015	62 549.58	89 959.16	NA	NA
2016	69 679.98	91 582.88	NA	NA
2017	80 658.94	93 959.64	NA	NA

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

^a The Party did not report indirect CO₂ emissions in CRF table 6.

Table 2
Greenhouse gas emissions by gas for Belarus, excluding land use, land-use change and forestry, 1990–2017

(kt CO₂ eq)

	<i>CO₂^a</i>	<i>CH₄</i>	<i>N₂O</i>	<i>HFCs</i>	<i>PFCs</i>	<i>Unspecified mix of HFCs and PFCs</i>	<i>SF₆</i>	<i>NF₃</i>
1990	104 138.51	18 743.79	16 391.99	NO, NE, NA	NO, NE, NA	NO, NE, NA	NE, NA, NO	NO, NE, NA
1995	57 949.60	14 311.21	11 420.18	NO, NE, NA	NO, NE, NA	NO, NE, NA	0.00	NO, NE, NA
2000	55 462.61	13 507.11	12 271.05	NO, NE, NA	NO, NE, NA	NO, NE, NA	0.10	NO, NE, NA
2010	63 883.29	15 981.51	13 898.98	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.10	NO, NE, NA
2011	62 822.73	15 877.57	14 675.67	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.30	NO, NE, NA
2012	63 706.59	16 187.81	14 374.30	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.46	NO, NE, NA
2013	64 462.30	16 595.34	14 303.46	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.51	NO, NE, NA
2014	63 794.06	16 740.07	14 051.34	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.43	NO, NE, NA
2015	59 290.99	16 919.42	13 746.24	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.52	NO, NE, NA
2016	60 942.00	16 720.68	13 917.46	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.74	NO, NE, NA
2017	62 699.20	16 875.28	14 382.26	NO, NE, NA	NO, NE, NA	NO, NE, NA	2.91	NO, NE, NA
Per cent change 1990–2017	–39.8	–10.0	–12.3	NA	NA	NA	NA	NA

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

^a Belarus did not report indirect CO₂ emissions in CRF table 6.

Table 3
Greenhouse gas emissions by sector for Belarus, 1990–2017

(kt CO₂ eq)

	<i>Energy</i>	<i>IPPU</i>	<i>Agriculture</i>	<i>LULUCF</i>	<i>Waste</i>	<i>Other</i>
1990	98 104.42	6 034.39	31 971.24	–21 104.96	3 164.24	NO
1995	55 091.38	3 745.79	22 319.09	–28 909.51	2 524.73	NO
2000	52 403.83	4 422.80	21 024.18	–33 242.76	3 390.05	NO
2010	58 591.50	6 266.63	23 482.33	–40 126.39	5 425.41	NO
2011	57 496.90	6 304.30	24 229.04	–37 577.30	5 348.03	NO
2012	58 251.04	6 346.14	24 259.75	–32 028.06	5 414.23	NO
2013	59 220.32	6 546.95	23 698.11	–35 121.61	5 898.22	NO
2014	57 998.09	6 895.46	23 612.74	–30 107.98	6 081.61	NO
2015	54 042.18	6 448.46	23 280.88	–27 409.57	6 187.64	NO
2016	56 029.56	6 042.67	23 450.71	–21 902.91	6 059.94	NO
2017	57 708.68	6 077.71	24 042.60	–13 300.71	6 130.66	NO
Per cent change 1990–2017	–41.2	0.7	–24.8	–37.0	93.7	NA

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in the total GHG emissions; (2) Belarus did not report indirect CO₂ emissions in CRF table 6.

Annex II

Additional information to support findings in table 2 in this report

Missing categories that may affect completeness

The categories for which 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 Fuel combustion – categories 1.A.1.a (public electricity and heat production), 1.A.2.c (chemicals), 1.A.2.g.viii (other) and 1.A.5.a (stationary) (CO₂, CH₄ and N₂O) (see ID# E.25 in table 3 in this report);
- (b) 1.A.3.a Domestic aviation (CO₂, CH₄ and N₂O) (see ID# E.55 in table 5 in this report);
- (c) 1.B.2 Oil and natural gas and other emissions from energy production – categories 1.B.2.a.1 (oil exploration) and 1.B.2.b.1 (gas exploration) (see ID# E.45 in table 3 in this report);
- (d) 2.D Non-energy products from fuels and solvent use – categories 2.D.1 (lubricant use) and 2.D.2 (paraffin wax use) (CO₂) (see ID# I.17 in table 3 in this report);
- (e) 2.E Electronics industry (HFCs, PFCs, SF₆ and NF₃) (see ID# I.18 in table 3 in this report);
- (f) 2.F Product uses as substitutes for ozone-depleting substances (HFCs, PFCs, SF₆, and NF₃) (see ID# I.19 in table 3 in this report);
- (g) 2.G.1 Electrical equipment (SF₆) (see ID# I.21 in table 3 in this report);
- (h) 2.G.2 SF₆ and PFCs from other product use (SF₆ and PFCs) (see ID# I.25 in table 5 in this report);
- (i) 4. General (LULUCF) – categories 4.A.2.1 (cropland converted to forest land), 4.A.2.2 (grassland converted to forest land), 4.A.2.3 (wetlands converted to forest land), 4.A.2.5 (other land converted to forest land), 4.B.2.1 (forest land converted to cropland), 4.B.2.2 (grassland converted to cropland), 4.B.2.3 (wetlands converted to cropland), 4.B.2.4 (settlements converted to cropland), 4.B.2.5 (other land converted to cropland), 4.C.2.1 (forest land converted to grassland), 4.C.2.2 (cropland converted to grassland), 4.C.2.3 (wetlands converted to grassland), 4.C.2.5 (other land converted to grassland), 4.D.1.3 (other wetlands remaining other wetlands), 4.D.2.3 (land converted to other wetlands), 4.E.1 (settlements remaining settlements), 4.E.2 (land converted to settlements) and 4.F.2 (land converted to other land) (CO₂, CH₄ and N₂O) (see ID#s L.1 and L.9 in table 3 in this report);
- (j) 4.G Harvested wood products (CO₂) (see ID# L. 11 in table 3 in this report);
- (k) 5.A Solid waste disposal on land (CH₄) (see ID# W.3 in table 3 in this report);
- (l) 5.B Biological treatment of solid waste (CH₄ and N₂O) (see ID# W.19 in table 5 in this report);
- (m) 5.C.1 Waste incineration (CO₂, CH₄ and N₂O) (see ID# W.13 in table 3 in this report);
- (n) 5.D.1 Domestic wastewater (CH₄) (see ID# W.20 in table 5 in this report).

Annex III

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at <https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

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 <http://www.ipcc-nggip.iges.or.jp/public/gp/landuse/gp/landuse.html>.

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 <http://www.ipcc-nggip.iges.or.jp/public/wetlands/>.

B. UNFCCC documents

Inventory review reports

Reports on the individual reviews of the 2013, 2014, 2015, 2016 and 2017 inventory submissions of Belarus, contained in documents FCCC/ARR/2013/BLR, FCCC/ARR/2014/BLR, FCCC/ARR/2015/BLR, FCCC/ARR/2016/BLR and FCCC/ARR/2017/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/sites/default/files/resource/AGI%202019.pdf>.

Annual status report for Belarus for 2019. Available at <http://unfccc.int/resource/docs/2019/asr/BLR.pdf>.

C. Other documents used during the review

Responses to questions during the review were received from Kristina Gonchar (Department of International Projects of the Belarusian Scientific and Research Centre “Ecology”), including additional material on the methodology and assumptions used.
