



Report on the simplified review of the national inventory report of Australia submitted in 2023¹

This report presents the results of the simplified review of the 2023 national inventory report of Australia, conducted by the secretariat in accordance with the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement.

¹ The simplified review of Australia's national inventory report under the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement was conducted in accordance with paragraphs 15–19 of the conclusions and recommendations from the 2023 joint meeting of lead reviewers, available at <https://unfccc.int/documents/627213>.

Abbreviations and acronyms

C	carbon
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CRF	common reporting format
CRT	common reporting tables
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood product
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
LULUCF	land use, land-use change and forestry
MPGs	modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement
N	nitrogen
N ₂ O	nitrous oxide
NA	not applicable
NE	not estimated
NF ₃	nitrogen trifluoride
NID	national inventory document
NIR	national inventory report
NO	not occurring
PFC	perfluorocarbon
TERT	technical expert review team

I. Introduction

1. This is a report on the simplified review of the national inventory report of Australia submitted in 2023. The review was conducted by the secretariat in accordance with the MPGs, particularly chapter VII thereof, on the technical expert review.²
2. In accordance with the MPGs, a draft version of this report was transmitted to Australia on 29 June 2023 for comments. Australia provided comments on the individual findings on 28 July 2023, which were addressed by the secretariat and reflected in this version of the report. In addition, Australia provided general comments on the report (see chap. III below).
3. The detailed findings of the review in the annex do not necessarily indicate issues of completeness or consistency in the Party's reporting with the MPGs.
4. This report, together with the individual comments from the Party and the detailed findings of the review, will be considered by the TERT in a subsequent technical expert review of Australia's NIR, in accordance with paragraph 155 of the MPGs.

II. Summary of the findings of the initial assessment

5. The secretariat conducted the simplified review of Australia's NIR submitted in 2023 as an initial assessment of its completeness and consistency with the MPGs, in accordance with paragraphs 155 and 163 of the MPGs. The table below provides a summary of the findings of the initial assessment. Detailed findings can be found in the annex.

Summary of the initial assessment

<i>Area of review</i>	<i>Scope</i>	<i>Assessment</i>
Dates of submission	Original submission	NID, 13 April 2023 CRT, 13 April 2023
	Revised submission	NA
	Previous submission used in the initial assessment	16 September 2022
Completeness		See table I.2
Recalculations ^a	Recalculations at subcategory level with impact of more than 2 per cent of total GHG emissions or removals, excluding LULUCF and above the threshold of significance	
	Threshold of significance for Australia in 2023 ^b	264.32 kt CO ₂ eq
	Recalculations in 2005 (reference year for Australia's nationally determined contribution) between the two most recent NIR submissions	See table I.1
	Recalculations in 2020 between the two most recent NIR submissions	See table I.1
Changes in notation keys	Changes in notation keys in 2005 and 2020 between the two most recent submissions	See table I.2
New key categories	New key categories in the most recent submission	See table I.2
Sectoral versus reference approaches	Discrepancies higher than 5 per cent in energy consumption or CO ₂ emissions per fuel type between reference and sectoral approaches in the latest reported year (2021)	No discrepancies identified
IEF comparison	Comparison between IEFs reported for significant subcategories of key categories, as relevant, and the	See table I.3

² Decision 18/CMA.1, annex.

<i>Area of review</i>	<i>Scope</i>	<i>Assessment</i>
	range of IEFs by developed country Parties in the latest inventory year (2021) ^c	
Time-series consistency	Time-series consistency in 2015–2021, with inter-annual variation higher than 2 per cent on emissions or removals that are above the threshold of significance for Australia. Analysis was undertaken at the category level for each sector in the CRT. The analysis considers each gas separately; for the energy sector all fuels in the given CRT category were included in the analysis	See table I.4
Global warming potential	Comparison of GWP used by the Party with GWP values from the Fifth IPCC Assessment Report, in accordance with paragraph 37 of the MPGs	No discrepancies identified
Tier methods	Use of higher tiers for key categories ^d	[No assessment conducted]
Previous recommendations	Status of implementation of previous recommendations ^e	[No assessment conducted]

Note: Unless otherwise specified, values from the most recent submission are included in this report.

^a The 2022 GHG inventory was submitted under decisions 24/CP.19 and 15/CMP.1 in conjunction with decisions 3/CMP.1 and 6/CMP.9. The 2023 GHG inventory was submitted under the MPGs. Both the 2022 and the 2023 GHG inventory submissions used the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

^b Threshold above which a category or gas is considered significant in accordance with paragraph 32 of the MPGs, calculated by the secretariat.

^c The range of IEFs of developed country Parties is based on the 2022 annual submission by Parties included in Annex I to the Convention as the 2023 submissions were not yet available.

^d This check will be fully implemented subject to the availability of the electronic reporting tool for the CRT, which will be ready in June 2024 in accordance with decision 5/CMA.3.

^e Not applicable for the simplified review of the 2023 GHG inventory submission of Australia, as this is the first submission under the Paris Agreement and there are no previous recommendations.

III. Comments from Australia on the initial assessment

6. Australia provided general comments on the report (see the box below; see also para. 2 above).

Comments from Australia on the initial assessment of its 2023 national inventory report

Australia welcomes the opportunity to be the first Party to participate in a simplified review of its national inventory under the Paris Agreement. These general comments outline Australia's key observations from our experience, including comments on specific findings in this report. We hope these observations will assist Parties' participation in future simplified reviews and inform further refinement of this new process.

From a Party-perspective, the use of automated checks achieves the efficiencies sought by the Parties in developing the MPGs. Such an approach does however mean that the simplified review report will include findings that are not discrepancies in completeness and consistency as explained in paragraph 3 of the review report. For example, this simplified review compares Australia's first national inventory submission under the Paris Agreement with its last submission under the UNFCCC; resulting in findings that reflect differences between the CRF and CRT rather than a discrepancy in inventory completeness or consistency. In the review report, the largest number of such findings occur in the "Changes in notation key" table I.2 (IDs I.2.1, I.2.4–7, I.2.13, I.2.16–19, I.2.47, I.2.50–51, I.2.54) and "Recalculations" table I.1 (ID I.1.5–7) and reflect instances where the CRT format has re-categorised the location in which a particular emissions source should be reported. Other such instances occur where the CRT format provides for greater disaggregation of emissions sources compared with the previous CRF (IDs I.2.2 and I.2.3, table I.2).

Development of automated checks that can be applied to all relevant Parties to identify genuine and material matters for consideration by a future TERT is challenging in some circumstances. The "Time-series consistency" automated check is a good example of this challenge in practice.

That automated check can be expected to report findings where Parties employ higher tier methods, and estimation methods that are able to distinguish inter-annual variability in the time-series driven for example by inter-annual variability in the underlying activity data. There are also sector-specific considerations, for example the *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, volume 4, table 2.6C provides guidance on which LULUCF estimation methodologies are capable of distinguishing inter-annual variability. A further consideration is that, as Parties accelerate the decarbonisation of their economies, the automated check will be more likely to identify as findings what is in reality a Party's rapid decarbonisation. Australia notes that the review report's findings on time-series consistency identified in table I.4 overwhelmingly represent normal inter-annual variability, rather than material issues of potential inconsistency. An automated check that compared inter-annual changes taking into account the expected normal range of emissions in each sector could be expected to return more statistically significant findings.

With regard to other findings in the simplified review report, Australia is pleased to advise that all the new key categories identified in findings IDs I.2.80-96 in table I.2 were estimated using IPCC tier 2 or 3 methods, consistent with IPCC guidelines. Other findings reflect Australia's misinterpretation of the CRT (table I.1, IDs I.1.32-37), which it has shared with the secretariat to assist other Parties in their completion of the new CRT, and issues associated with the manual population of the CRT due to the new CRT reporter tool being under development.

Australia thanks the secretariat for its support in completing its first simplified review under the Paris Agreement.

Note: Comments are presented verbatim, as provided by Australia.

Annex

Findings of the initial assessment of Australia's 2023 national inventory report

Table I.1
Findings on recalculations

<i>IDs#</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Difference</i>	<i>Unit</i>	<i>Difference (%)</i>
I.1.1	1.A.4. Other sectors	table1	CO ₂	2020	20 231.84	21 446.45	-1 214.61	kt	-5.7
I.1.2	1.A.4.a. Commercial/institutional	table1	CO ₂	2020	4 902.06	5 715.28	-813.22	kt	-14.2
I.1.3	1.A.4.b. Residential	table1	CO ₂	2020	9 745.81	10 147.21	-401.39	kt	-4.0
I.1.4	1.B. Fugitive emissions from fuels	table1	CO ₂	2020	14 551.69	17 272.75	-2 721.07	kt	-15.8
I.1.5	1.B.1.a. Coal mining and handling	table1	CO ₂	2020	2 380.48	1 329.64	1 050.84	kt	79.0
I.1.6	1.B.2. Oil and natural gas and other emissions from energy production	table1	CO ₂	2020	12 171.21	14 891.54	-2 720.33	kt	-18.3
I.1.7	1.B.2.b. Natural gas	table1	CO ₂	2020	-2 682.91	37.41	-2 720.33	kt	-7 270.8
I.1.8	1.D.3. CO ₂ emissions from biomass	table1	CO ₂	2020	16 307.71	15 788.50	519.20	kt	3.3
I.1.9	2. Total industrial processes	table2(i)	HFCs	2020	10 949.19	11 564.39	-615.20	kt	-5.3
I.1.10	2.F. Product uses as substitutes for ozone-depleting substances	table2(i)	HFCs	2020	10 949.19	11 564.39	-615.20	kt	-5.3
I.1.11	2.F.1. Refrigeration and air conditioning	table2(i)	HFCs	2020	10 339.14	10 916.90	-577.76	kt	-5.3
I.1.12	4. Total LULUCF	table4	Net CO ₂ emissions/removals	2020	-59 086.94	-56 621.31	-2 465.62	kt	4.4
I.1.13	4. Total LULUCF	table4	CH ₄	2020	475.94	511.59	-35.65	kt	-7.0
I.1.14	4.A. Forest land	table4	Net CO ₂ emissions/removals	2020	-83 852.81	-79 323.01	-4 529.79	kt	5.7
I.1.15	4.A. Forest land	table4	CH ₄	2020	196.83	214.24	-17.41	kt	-8.1
I.1.16	4.A.1. Forest land remaining forest land	table4	CH ₄	2020	190.60	212.39	-21.79	kt	-10.3
I.1.17	4.A.2. Land converted to forest land	table4	Net CO ₂ emissions/removals	2020	-36 674.70	-33 004.81	-3 669.88	kt	11.1
I.1.18	4.C. Grassland	table4	Net CO ₂ emissions/removals	2020	24 209.51	22 125.34	2 084.17	kt	9.4
I.1.19	4.C.1. Grassland remaining grassland	table4	Net CO ₂ emissions/removals	2020	-10 622.34	-12 476.69	1 854.34	kt	-14.9
I.1.20	4.D. Wetlands	table4	CH ₄	2020	74.31	94.23	-19.92	kt	-21.1
I.1.21	4.D.1. Wetlands remaining wetlands	table4	CH ₄	2020	73.78	12.54	61.25	kt	488.6
I.1.22	4. Total LULUCF	table4	Net CO ₂ emissions/removals	2005	57 467.76	60 943.22	-3 475.46	kt	-5.7
I.1.23	4. Total LULUCF	table4	CH ₄	2005	673.38	718.99	-45.61	kt	-6.3

<i>IDs#</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Difference</i>	<i>Unit</i>	<i>Difference (%)</i>
I.1.24	4.A. Forest land	table4	Net CO ₂ emissions/removals	2005	-45 077.92	-42 373.13	-2 704.79	kt	6.4
I.1.25	4.A.1. Forest land remaining forest land	table4	Net CO ₂ emissions/removals	2005	-22 416.18	-20 503.47	-1 912.72	kt	9.3
I.1.26	4.A.2. Land converted to forest land	table4	Net CO ₂ emissions/removals	2005	-22 661.74	-21 869.66	-792.07	kt	3.6
I.1.27	4.D. Wetlands (5)	table4	CH ₄	2005	85.34	125.85	-40.51	kt	-32.2
I.1.28	4.D.1. Wetlands remaining wetlands	table4	CH ₄	2005	75.82	14.70	61.12	kt	415.7
I.1.29	5. Total waste	table5	CH ₄	2020	467.72	442.78	24.94	kt	5.6
I.1.30	5.A. Solid waste disposal	table5	CH ₄	2020	364.94	340.41	24.53	kt	7.2
I.1.31	5.A.1. Managed waste disposal sites	table5	CH ₄	2020	364.94	340.41	24.53	kt	7.2
I.1.32	5.F.1. Long-term storage of carbon in waste disposal sites	table5	CO ₂	2020	-319 531.70	87 033.69	-406 565.40	kt	-467.1
I.1.33	5.F.1.a. Annual change in total long-term carbon storage	table5	CO ₂	2020	-4 192.92	1 115.01	-5 307.93	kt	-476.0
I.1.34	5.F.1.b. Annual change in total long-term carbon storage in HWP waste (4)	table5	CO ₂	2020	-1 228.20	476.41	-1 704.61	kt	-357.8
I.1.35	5.F.1. Long-term storage of carbon in waste disposal sites	table5	CO ₂	2005	-254 050.20	69 282.36	-323 332.56	kt	-466.7
I.1.36	5.F.1.a. Annual change in total long-term carbon storage	table5	CO ₂	2005	-5 875.64	1 369.71	-7 245.34	kt	-529.0
I.1.37	5.F.1.b. Annual change in total long-term carbon storage in HWP waste (4)	table5	CO ₂	2005	-3 472.24	1 106.58	-4 578.82	kt	-413.8

Table I.2
Findings on completeness, changes in notation keys and sectoral versus reference approach

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Finding type</i>
I.2.1	1.B.1.a. Coal mining and handling	table1	N ₂ O	2020	0.00	NO	Change in notation key
I.2.2	1.B.1.b. Fuel transformation	table1	CO ₂	2020	IE, NO	IE	Change in notation key
I.2.3	1.B.1.b. Fuel transformation	table1	CH ₄	2020	IE, NO	IE	Change in notation key
I.2.4	1.B.1.c. Other	table1	CO ₂	2020	NA	1 051.58	Change in notation key
I.2.5	1.B.1.c. Other	table1	CH ₄	2020	NA	3.47	Change in notation key
I.2.6	1.B.1.c. Other	table1	N ₂ O	2020	NA	0.00	Change in notation key
I.2.7	1.B.2.b. Natural gas	table1	N ₂ O	2020	0.00		Change in notation key
I.2.8	1.D.2. Multilateral operations	table1	CO ₂	2020	NE	NO	NE detection

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Finding type</i>
I.2.9	1.D.2. Multilateral operations	table1	CH ₄	2020	NE	NO	NE detection
I.2.10	1.D.2. Multilateral operations	table1	N ₂ O	2020	NE	NO	NE detection
I.2.11	1.D.4. CO ₂ captured	table1	CO ₂	2020	2 720.33	NO, NA	Change in notation key
I.2.12	1.D.4.a. For domestic storage	table1	CO ₂	2020	2 720.33	NO	Change in notation key
I.2.13	1.B.1.a. Coal mining and handling	table1	N ₂ O	2005	0.00	NO	Change in notation key
I.2.14	1.B.1.b. Fuel transformation	table1	CO ₂	2005	IE, NO	IE	Change in notation key
I.2.15	1.B.1.b. Fuel transformation	table1	CH ₄	2005	IE, NO	IE	Change in notation key
I.2.16	1.B.1.c. Other	table1	CO ₂	2005	NA	60.19	Change in notation key
I.2.17	1.B.1.c. Other	table1	CH ₄	2005	NA	0.19	Change in notation key
I.2.18	1.B.1.c. Other	table1	N ₂ O	2005	NA	0.00	Change in notation key
I.2.19	1.B.2.b. Natural gas	table1	N ₂ O	2005	0.00		Change in notation key
I.2.20	1.D.2. Multilateral operations	table1	CO ₂	2005	NE	NO	NE detection
I.2.21	1.D.2. Multilateral operations	table1	CH ₄	2005	NE	NO	NE detection
I.2.22	1.D.2. Multilateral operations	table1	N ₂ O	2005	NE	NO	NE detection
I.2.23	2.A.3. Glass production	table2(i)	CO ₂	2020	78.47	IE	Change in notation key
I.2.24	2.B.5. Carbide production	table2(i)	CO ₂	2020	IE	NO, IE	Change in notation key
I.2.25	2.B.8. Petrochemical and carbon black production	table2(i)	CO ₂	2020	NO	NO, IE	Change in notation key
I.2.26	2.B.10. Other	table2(i)	CH ₄	2020	IE, NO	NO	Change in notation key
I.2.27	2.C.1. Iron and steel production	table2(i)	CO ₂	2020	IE	NO, IE	Change in notation key
I.2.28	2.C.1. Iron and steel production	table2(i)	CH ₄	2020	IE	NO, IE	Change in notation key
I.2.29	2.D.2. Paraffin wax use	table2(i)	CO ₂	2020	NE	NO	NE detection
I.2.30	2.G. Other product manufacture and use	table2(i)	N ₂ O	2020	IE	NO, IE	Change in notation key
I.2.31	2.A.3. Glass production	table2(i)	CO ₂	2005	99.66	IE	Change in notation key
I.2.32	2.B.5. Carbide production	table2(i)	CO ₂	2005	IE	NO, IE	Change in notation key
I.2.33	2.B.8. Petrochemical and carbon black production	table2(i)	CO ₂	2005	46.86	NO, IE	Change in notation key
I.2.34	2.B.10. Other	table2(i)	CH ₄	2005	IE, NO	NO	Change in notation key
I.2.35	2.C.1. Iron and steel production	table2(i)	CO ₂	2005	IE	NO, IE	Change in notation key
I.2.36	2.C.1. Iron and steel production	table2(i)	CH ₄	2005	IE	NO, IE	Change in notation key
I.2.37	2.D.2. Paraffin wax use	table2(i)	CO ₂	2005	NE	NO	NE detection
I.2.38	2.G. Other product manufacture and use	table2(i)	N ₂ O	2005	IE	NO, IE	Change in notation key
I.2.39	3.D. Agricultural soils (4, 5)	table3	CH ₄	2020	NE	NE	NE detection
I.2.40	3.E. Prescribed burning of savannahs	table3	CH ₄	2020	NA	IE	Change in notation key

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Finding type</i>
I.2.41	3.E. Prescribed burning of savannahs	table3	N ₂ O	2020	NA	IE	Change in notation key
I.2.42	3.I. Other carbon-containing fertilizers	table3	CO ₂	2020	NE	NE	NE detection
I.2.43	3.D. Agricultural soils (4, 5)	table3	CH ₄	2005	NE	NE	NE detection
I.2.44	3.E. Prescribed burning of savannahs	table3	CH ₄	2005	NA	IE	Change in notation key
I.2.45	3.E. Prescribed burning of savannahs	table3	N ₂ O	2005	NA	IE	Change in notation key
I.2.46	3.I. Other carbon-containing fertilizers	table3	CO ₂	2005	NE	NE	NE detection
I.2.47	4.D.2. Land converted to wetlands	table4	CH ₄	2020	0.53	NO, IE	Change in notation key
I.2.48	4.D.2. Land converted to wetlands	table4	N ₂ O	2020	NO	NO, IE, NA	Change in notation key
I.2.49	4.E.1. Settlements remaining settlements	table4	CH ₄	2020	IE	NE	Change in notation key
I.2.50	4.E.2. Land converted to settlements	table4	CH ₄	2020	0.59	NA	Change in notation key
I.2.51	4.D.2. Land converted to wetlands	table4	CH ₄	2005	9.52	NO, IE	Change in notation key
I.2.52	4.D.2. Land converted to wetlands	table4	N ₂ O	2005	NO	NO, IE, NA	Change in notation key
I.2.53	4.E.1. Settlements remaining settlements	table4	CH ₄	2005	IE	NE	Change in notation key
I.2.54	4.E.2. Land converted to settlements	table4	CH ₄	2005	4.74	NA	Change in notation key
I.2.55	4.H. Other (please specify)	table4	Net CO ₂ emissions/removals	2005	10.84	NA	Change in notation key
I.2.56	5.B.2. Anaerobic digestion at biogas facilities	table5	CH ₄	2020	NO, NE	NO, NE	NE detection
I.2.57	5.B.2. Anaerobic digestion at biogas facilities	table5	N ₂ O	2020	NO, NE	NO, NE	NE detection
I.2.58	5.C. Incineration and open burning of waste	table5	CH ₄	2020	NO, NE	NO, NE	NE detection
I.2.59	5.C. Incineration and open burning of waste	table5	N ₂ O	2020	NO, NE	NO, NE	NE detection
I.2.60	5.C.1. Waste incineration	table5	CH ₄	2020	NO, NE	NO, NE	NE detection
I.2.61	5.C.1. Waste incineration	table5	N ₂ O	2020	NO, NE	NO, NE	NE detection
I.2.62	5.E. Other (please specify)	table5	CO ₂	2020	NE	NE	NE detection
I.2.63	5.E. Other (please specify)	table5	CH ₄	2020	NE	NE	NE detection
I.2.64	5.E. Other (please specify)	table5	N ₂ O	2020	NE	NE	NE detection
I.2.65	Accidental fires at solid waste disposal sites	table5	CO ₂	2020	NE	NE	NE detection
I.2.66	Accidental fires at solid waste disposal sites	table5	CH ₄	2020	NE	NE	NE detection
I.2.67	Accidental fires at solid waste disposal sites	table5	N ₂ O	2020	NE	NE	NE detection
I.2.68	5.B.2. Anaerobic digestion at biogas facilities	table5	CH ₄	2005	NO, NE	NO, NE	NE detection
I.2.69	5.B.2. Anaerobic digestion at biogas facilities	table5	N ₂ O	2005	NO, NE	NO, NE	NE detection
I.2.70	5.C. Incineration and open burning of waste	table5	CH ₄	2005	NO, NE	NO, NE	NE detection
I.2.71	5.C. Incineration and open burning of waste	table5	N ₂ O	2005	NO, NE	NO, NE	NE detection

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Previous submission (2022)</i>	<i>Finding type</i>
I.2.72	5.C.1. Waste incineration	table5	CH ₄	2005	NO, NE	NO, NE	NE detection
I.2.73	5.C.1. Waste incineration	table5	N ₂ O	2005	NO, NE	NO, NE	NE detection
I.2.74	5.E. Other (please specify)	table5	CO ₂	2005	NE	NE	NE detection
I.2.75	5.E. Other (please specify)	table5	CH ₄	2005	NE	NE	NE detection
I.2.76	5.E. Other (please specify)	table5	N ₂ O	2005	NE	NE	NE detection
I.2.77	Accidental fires at solid waste disposal sites	table5	CO ₂	2005	NE	NE	NE detection
I.2.78	Accidental fires at solid waste disposal sites	table5	CH ₄	2005	NE	NE	NE detection
I.2.79	Accidental fires at solid waste disposal sites	table5	N ₂ O	2005	NE	NE	NE detection
I.2.80	1.A.3.b Road transportation	table7	CH ₄	2021	–	–	New key category (excluding LULUCF)
I.2.81	1.A.3.d Domestic navigation – liquid fuels	table7	CO ₂	2021	–	–	New key category (including LULUCF)
I.2.82	1.A.3.e Other transportation	table7	CO ₂	2021	–	–	New key category (excluding LULUCF)
I.2.83	1.A.4 Other sectors – biomass	table7	CH ₄	2021	–	–	New key category (including LULUCF)
I.2.84	1.B.2.c Fugitive emissions from fuels – venting and flaring	table7	CH ₄	2021	–	–	New key category (including LULUCF)
I.2.85	2.A.2 Lime production	table7	CO ₂	2021	–	–	New key category (excluding LULUCF)
I.2.86	2.A.4 Other process uses of carbonates	table7	CO ₂	2021	–	–	New key category (excluding LULUCF)
I.2.87	2.A.4 Other process uses of carbonates	table7	CO ₂	2021	–	–	New key category (including LULUCF)
I.2.88	2.B.2 Nitric acid production	table7	N ₂ O	2021	–	–	New key category (excluding LULUCF)
I.2.89	2.B.2 Nitric acid production	table7	N ₂ O	2021	–	–	New key category (including LULUCF)
I.2.90	2.B.9 Fluorochemical production	table7	Aggregate fluorinated gases	2021	–	–	New key category (including LULUCF)
I.2.91	2.C.1 Iron and steel production	table7	CO ₂	2021	–	–	New key category (excluding LULUCF)
I.2.92	2.C.1 Iron and steel production	table7	CO ₂	2021	–	–	New key category (including LULUCF)
I.2.93	2.C.3 Aluminium production	table7	CO ₂	2021	–	–	New key category (including LULUCF)
I.2.94	2.F.4 Aerosols	table7	Aggregate fluorinated gases	2021	–	–	New key category (excluding LULUCF)
I.2.95	3.G Liming	table7	CO ₂	2021	–	–	New key category (including LULUCF)
I.2.96	4(II). Emissions and removals from drainage and rewetting and other management of organic and mineral soils	table7	CH ₄	2021	–	–	New key category (including LULUCF)
I.2.97	Unspecified mix of HFCs and PFCs	table10s6	CO ₂ eq	2021	NO	–	Gas or sector not reported
I.2.98	NF ₃	table10s6	CO ₂ eq	2021	NO	–	Gas or sector not reported
I.2.99	6. Other	table10s6	CO ₂ eq	2021	NO	–	Gas or sector not reported

Table I.3

Findings on comparison between implied emission factors reported for key categories [in 2021] and the range of implied emission factors from national inventory reports of developed country Parties [in 2020]

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Inventory year</i>	<i>Latest submission (2023)</i>	<i>Unit</i>	<i>Finding type</i>
I.3.1	1.B.1.a.i.2. Post-mining activities	table1.b.1	CH ₄	2021	0.385	kg/t	IEF outside range (0.603 to 2.68)
I.3.2	3.A.1. Cattle	table3.a	CH ₄	2021	56.17	kg CH ₄ /head/year	IEF outside range (60.96 to 100.82)
I.3.3	2.F.1.f. Stationary air-conditioning – product manufacturing factor	table2(ii).b-hs2	HFC-134a	2021	0.026	%	IEF outside range (0.03 to 50.11)
I.3.4	2.F.1.f. Stationary air-conditioning – product manufacturing factor	table2(ii).b-hs2	HFC-143a	2021	0.026	%	IEF outside range (0.10 to 1.00)
I.3.5	4(II).D.2. Land converted to wetland – total mineral soils	table4(ii)	CH ₄	2021	203.51	kg CH ₄ /ha	IEF outside range (0.16 to 183.82)
I.3.6	1.A.4.b.i. Stationary combustion – biomass	table1.a(a)s4	CH ₄	2021	750.17	kg/TJ	IEF outside range (0.74 to 492.25)
I.3.7	3.D.2.b. Nitrogen leaching and run-off	table3.d	N ₂ O	2021	0.0110	t N/year	IEF outside range (0.0023 to 0.0080)
I.3.8	4.E.2.a. Forest land converted to settlements – carbon stock change in organic soils	table4.e	CO ₂	2021	0.11	t C/ha	IEF outside range (–13.79 to –0.59)

Table I.4

Findings on time-series consistency

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Value 1</i>	<i>Value 2</i>	<i>Difference</i>	<i>Unit</i>	<i>Difference (CO₂ eq)</i>	<i>Difference (%)</i>
I.4.1	1.A.1.a. Public electricity and heat production	table1	CH ₄	2019	2020	21.25	11.01	–10.24	kt	–286.71	–48.2
I.4.2	1.A.1.b. Petroleum refining	table1	CO ₂	2015	2016	4 027.86	3 109.53	–918.33	kt	–918.33	–22.8
I.4.3	1.A.1.b. Petroleum refining	table1	CO ₂	2019	2020	3 002.04	2 651.55	–350.49	kt	–350.49	–11.7
I.4.4	1.A.1.c. Manufacture of solid fuels and other energy industries	table1	CO ₂	2015	2016	18 876.17	21 400.07	2 523.89	kt	2 523.89	13.4
I.4.5	1.A.1.c. Manufacture of solid fuels and other energy industries	table1	CO ₂	2016	2017	21 400.07	25 390.48	3 990.41	kt	3 990.41	18.6
I.4.6	1.A.1.c. Manufacture of solid fuels and other energy industries	table1	CO ₂	2018	2019	27 548.22	31 002.23	3 454.01	kt	3 454.01	12.5
I.4.7	1.A.2.c. Chemicals	table1	CO ₂	2015	2016	8 542.41	7 434.50	–1 107.91	kt	–1 107.91	–13.0
I.4.8	1.A.3.a. Domestic aviation	table1	CO ₂	2019	2020	8 452.55	6 630.19	–1 822.36	kt	–1 822.36	–21.6
I.4.9	1.A.3.a. Domestic aviation	table1	CO ₂	2020	2021	6 630.19	4 378.98	–2 251.22	kt	–2 251.22	–34.0
I.4.10	1.A.4.c. Agriculture/forestry/fishing	table1	CO ₂	2018	2019	7 624.03	6 300.83	–1 323.20	kt	–1 323.20	–17.4
I.4.11	1.A.4.c. Agriculture/forestry/fishing	table1	CO ₂	2019	2020	6 300.83	5 583.97	–716.86	kt	–716.86	–11.4

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Value 1</i>	<i>Value 2</i>	<i>Difference</i>	<i>Unit</i>	<i>Difference (CO₂ eq)</i>	<i>Difference (%)</i>
I.4.12	1.A.4.c. Agriculture/forestry/fishing	table1	CO ₂	2020	2021	5 583.97	7 707.85	2 123.88	kt	2 123.88	38.0
I.4.13	1.B.1.a. Coal mining and handling	table1	CO ₂	2018	2019	2 361.50	2 062.35	-299.15	kt	-299.15	-12.7
I.4.14	1.B.1.a. Coal mining and handling	table1	CO ₂	2019	2020	2 062.35	2 380.48	318.13	kt	318.13	15.4
I.4.15	1.B.1.a. Coal mining and handling	table1	CO ₂	2020	2021	2 380.48	2 087.87	-292.60	kt	-292.60	-12.3
I.4.16	1.B.2.b. Natural gas	table1	CO ₂	2019	2020	24.64	-2 682.91	-2 707.55	kt	-2 707.55	-10 990.0
I.4.17	1.B.2.b. Natural gas	table1	CH ₄	2017	2018	166.84	185.11	18.27	kt	511.54	11.0
I.4.18	1.B.2.c. Venting and flaring	table1	CO ₂	2015	2016	8 688.80	10 140.32	1 451.52	kt	1 451.52	16.7
I.4.19	1.B.2.c. Venting and flaring	table1	CO ₂	2016	2017	10 140.32	12 460.27	2 319.95	kt	2 319.95	22.9
I.4.20	1.B.2.c. Venting and flaring	table1	CO ₂	2017	2018	12 460.27	14 319.26	1 858.99	kt	1 858.99	14.9
I.4.21	1.B.2.c. Venting and flaring	table1	CO ₂	2018	2019	14 319.26	18 003.56	3 684.30	kt	3 684.30	25.7
I.4.22	1.B.2.c. Venting and flaring	table1	CO ₂	2019	2020	18 003.56	14 747.25	-3 256.32	kt	-3 256.32	-18.1
I.4.23	1.B.2.c. Venting and flaring	table1	CO ₂	2020	2021	14 747.25	13 220.08	-1 527.17	kt	-1 527.17	-10.4
I.4.24	1.B.2.c. Venting and flaring	table1	CH ₄	2015	2016	78.73	68.08	-10.65	kt	-298.13	-13.5
I.4.25	1.B.2.c. Venting and flaring	table1	CH ₄	2016	2017	68.08	93.95	25.87	kt	724.38	38.0
I.4.26	1.B.2.c. Venting and flaring	table1	CH ₄	2018	2019	86.40	100.87	14.47	kt	405.16	16.7
I.4.27	1.B.2.c. Venting and flaring	table1	CH ₄	2019	2020	100.87	82.31	-18.55	kt	-519.49	-18.4
I.4.28	1.B.2.c. Venting and flaring	table1	CH ₄	2020	2021	82.31	67.89	-14.43	kt	-403.94	-17.5
I.4.29	1.D.1.a. Aviation	table1	CO ₂	2019	2020	15 338.74	11 757.88	-3 580.85	kt	-3 580.85	-23.3
I.4.30	1.D.1.a. Aviation	table1	CO ₂	2020	2021	11 757.88	3 840.56	-7 917.33	kt	-7 917.33	-67.3
I.4.31	1.D.1.b. Navigation	table1	CO ₂	2020	2021	2 130.67	1 403.99	-726.67	kt	-726.67	-34.1
I.4.32	1.D.3. CO ₂ emissions from biomass	table1	CO ₂	2017	2018	20 250.58	16 465.22	-3 785.36	kt	-3 785.36	-18.7
I.4.33	1.D.4.a. For domestic storage	table1	CO ₂	2020	2021	2 720.33	2 170.59	-549.73	kt	-549.73	-20.2
I.4.34	2.B.1. Ammonia production	table2(i)	CO ₂	2018	2019	2 416.71	1 953.38	-463.33	kt	-463.33	-19.2
I.4.35	2.B.2. Nitric acid production	table2(i)	N ₂ O	2017	2018	5.09	6.10	1.01	kt	268.67	19.9
I.4.36	2.B.2. Nitric acid production	table2(i)	N ₂ O	2018	2019	6.10	7.48	1.37	kt	363.55	22.5
I.4.37	2.B.2. Nitric acid production	table2(i)	N ₂ O	2020	2021	6.53	5.50	-1.03	kt	-272.63	-15.7
I.4.38	2.G.1. Electrical equipment	table2(ii)	SF ₆	2017	2018	4.21	5.51	1.30	t	30 505.39	30.8
I.4.39	2.G.1. Electrical equipment	table2(ii)	SF ₆	2019	2020	5.14	3.76	-1.38	t	-32 344.66	-26.8
I.4.40	2.G.1. Electrical equipment	table2(ii)	SF ₆	2020	2021	3.76	6.02	2.26	t	53 160.31	60.1
I.4.41	3.D.1. Direct N ₂ O emissions from managed soils	table3	N ₂ O	2016	2017	33.37	37.89	4.51	kt	1 196.10	13.5
I.4.42	3.D.1. Direct N ₂ O emissions from managed soils	table3	N ₂ O	2017	2018	37.89	34.05	-3.83	kt	-1 015.77	-10.1
I.4.43	3.D.1. Direct N ₂ O emissions from managed soils	table3	N ₂ O	2020	2021	31.21	37.88	6.67	kt	1 767.44	21.4

<i>ID</i>	<i>Category</i>	<i>CRT</i>	<i>Gas</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Value 1</i>	<i>Value 2</i>	<i>Difference</i>	<i>Unit</i>	<i>Difference (CO₂ eq)</i>	<i>Difference (%)</i>
I.4.44	3.D.1.a. Inorganic N fertilizers	table3	N ₂ O	2020	2021	8.09	9.30	1.21	kt	319.84	14.9
I.4.45	3.D.1.d. Crop residues	table3	N ₂ O	2016	2017	12.79	16.80	4.01	kt	1 061.77	31.3
I.4.46	3.D.1.d. Crop residues	table3	N ₂ O	2017	2018	16.80	13.51	-3.29	kt	-871.45	-19.6
I.4.47	3.D.1.d. Crop residues	table3	N ₂ O	2020	2021	11.63	16.53	4.91	kt	1 299.99	42.2
I.4.48	3.D.2. Indirect N ₂ O emissions from managed soils	table3	N ₂ O	2020	2021	10.28	11.31	1.03	kt	273.30	10.0
I.4.49	3.H. Urea application	table3	CO ₂	2020	2021	1 478.16	1 765.00	286.85	kt	286.85	19.4
I.4.50	4.A.1. Forest land remaining forest land	table4	CH ₄	2017	2018	265.75	222.83	-42.92	kt	-1 201.70	-16.1
I.4.51	4.A.1. Forest land remaining forest land	table4	CH ₄	2019	2020	223.07	190.60	-32.47	kt	-909.26	-14.6
I.4.52	4.B.1. Cropland remaining cropland	table4	Net CO ₂	2020	2021	896.99	3 085.19	2 188.20	t	2 188.20	243.9
I.4.53	4.B.2. Land converted to cropland	table4	Net CO ₂	2015	2016	3 086.22	1 943.15	-1 143.07	t	-1 143.07	-37.0
I.4.54	4.B.2. Land converted to cropland	table4	Net CO ₂	2017	2018	2 017.93	1 192.15	-825.77	t	-825.77	-40.9
I.4.55	4.B.2. Land converted to cropland	table4	Net CO ₂	2018	2019	1 192.15	2 579.57	1 387.41	t	1 387.41	116.4
I.4.56	4.B.2. Land converted to cropland	table4	Net CO ₂	2019	2020	2 579.57	1 746.25	-833.31	t	-833.31	-32.3
I.4.57	4.C.1. Grassland remaining grassland	table4	CH ₄	2017	2018	210.01	187.03	-22.98	kt	-643.46	-10.9
I.4.58	4.C.1. Grassland remaining grassland	table4	N ₂ O	2015	2016	8.28	7.21	-1.07	kt	-284.39	-13.0
I.4.59	4.C.2. Land converted to grassland	table4	Net CO ₂	2017	2018	37 179.86	42 525.83	5 345.97	t	5 345.97	14.4
I.4.60	4.C.2. Land converted to grassland	table4	Net CO ₂	2018	2019	42 525.83	28 162.89	-14 362.93	t	-14 362.93	-33.8
I.4.61	4.C.2. Land converted to grassland	table4	Net CO ₂	2019	2020	28 162.89	34 831.85	6 668.96	t	6 668.96	23.7
I.4.62	4.C.2. Land converted to grassland	table4	Net CO ₂	2020	2021	34 831.85	20 865.49	-13 966.37	t	-13 966.37	-40.1
I.4.63	4.D.1. Wetlands remaining wetlands	table4	Net CO ₂	2015	2016	429.09	-263.45	-692.54	t	-692.54	-161.4
I.4.64	4.D.1. Wetlands remaining wetlands	table4	CH ₄	2016	2017	84.56	94.01	9.44	kt	264.44	11.2
I.4.65	4.E.2. Land converted to settlements	table4	Net CO ₂	2015	2016	3 825.40	4 442.11	616.71	t	616.71	16.1
I.4.66	4.E.2. Land converted to settlements	table4	Net CO ₂	2017	2018	4 443.49	3 691.65	-751.85	t	-751.85	-16.9