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Report on the simplified review of the national inventory report of Luxembourg submitted in 2025

Summary

This report presents the results of the simplified review of the 2025 national inventory report of Luxembourg, 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.

Abbreviations and acronyms

CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRT	common reporting table
GHG	greenhouse gas
HFC	hydrofluorocarbon
HWP	harvested wood products
IEF	implied emission factor
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_2O	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

I. Introduction

1. This report covers the simplified review of the NIR of Luxembourg submitted in 2025. The review was conducted by the secretariat in accordance with the MPGs,[1] particularly chapter VII thereof, and the simplified review procedures.[2]

2. On 21 May 2025 a draft version of this report was transmitted to the Government of Luxembourg, which provided comments on individual findings on 26 June 2025 that were addressed by the secretariat and incorporated, as appropriate, in this final version of the report.[3] In addition, Luxembourg provided general comments on the report (see chap. II.B below).

3. The secretariat conducted the simplified review of Luxembourg's NIR, which involved an initial assessment of completeness and consistency with the MPGs.[4]

4. The findings of the initial assessment, presented in the annex, are the result of automated checks and do not necessarily indicate issues of completeness or consistency of the Party's reporting with the MPGs.

5. This report, including the findings listed in the annex and any comments provided by the Party (see para. 2 above), will be made available to and considered by the technical expert review team as part of the subsequent technical expert review of Luxembourg's NIR.[5]

II. Initial assessment of completeness and consistency with the modalities, procedures and guidelines

A. Summary of findings

6. The table below provides a summary of the findings of the initial assessment by the secretariat. Tables I.1–I.7 list the findings and include detailed information on each one.

Summary of the initial assessment

Area of review	*Description*	*Assessment*
Dates of submission	2025 submission: CRTs, 15 April 2025	
	2024 submission: CRTs, 31 December 2024	
Recalculations	Recalculations that have changed estimated total GHG emissions or removals (excluding LULUCF) by more than 2 per cent for categories or subcategories above the threshold of significance (**3.88 kt CO_2 eq** for 2023)[a]	
	Recalculations for 1990 (the reference year for the Party's nationally determined contribution) and 2022 since the previous submission	See table I.1
Completeness	Detection of notation key "NE", or of missing gases or sectors in CRT 10 emission trends summary	See table I.2
Notation keys	Changes in notation keys reported for 1990 and 2022 since the previous submission	See table I.3
Sectoral and reference approaches	Difference in estimated energy consumption or CO_2 emissions, by fuel type, of more than 5 per cent between the reference and sectoral approaches for the latest reported year (2023)	See table I.4
Time-series consistency	The time series of emissions is assessed by calculating inter-annual changes for each category and gas and converting them	See table I.5

[1] Decision 18/CMA.1, annex.
[2] Contained in paras. 15–19 of the conclusions and recommendations from the 2023 joint meeting of lead reviewers, available at https://unfccc.int/documents/627213.
[3] As per para. 163 of the MPGs.
[4] As per para. 155 of the MPGs.
[5] As per para. 155 of the MPGs.

Area of review	*Description*	*Assessment*
	to CO_2 eq. Inter-annual changes exceeding the significance threshold are evaluated using the z-score method,[b] where outliers are identified as values exceeding a z-score of 3, based on the statistical distribution of the full time series	
IEFs	Comparison of IEFs reported for any significant subcategories under key categories with the range of IEFs reported by developed country Parties for the latest inventory year (2023) in their 2025 submission[c]	See table I.6
Key categories	New key categories identified since the previous submission for level (latest year) and trend	See table I.7
Previous areas of improvement	Status of implementation of previous areas of improvement identified in the latest report on the technical expert review of the Party's biennial transparency report	NA[d]

[a] Threshold calculated by the secretariat as 0.05 per cent of the national total GHG emissions for 2023, excluding LULUCF, or 500 kt CO_2 eq, whichever is lower (see para. 32 of the MPGs).

[b] Statistical measure that indicates how many standard deviations a data point is from the mean.

[c] Range defined by the median plus or minus two times the standard deviation, calculated from all available data points per category.

[d] As at the time of publication of this report, information on status of implementation of previous areas of improvement was not yet available.

B. Comments of the Party on the initial assessment

7. The Party provided general comments,[6] which are reported in the box below.

> For most of the individual findings, explanations are given in Luxembourg's NID. Also, individual findings are often on aggregated CRT categories, and make explanations difficult because multiple subcategories contribute to changes between years. This is especially valid for a small country where the start or shut-down of one company can heavily impact the emissions trend. In the future, it would be good that findings are raised only for cases where no explanation is given in the NID.

[6] The comments provided by Luxembourg are presented verbatim.

Annex

Findings of the initial assessment of Luxembourg's 2025 national inventory report

Tables I.1–I.7 detail the findings of the initial assessment by the secretariat of the Party's NIR.

Table I.1
Findings on recalculations

ID#	*Category*	*CRT*	*Gas*	*Inventory year*	*Estimate in latest submission (2025)*	*Estimate in previous submission (2024)*	*Difference*	*Unit*	*Difference (%)*	*Difference (kt CO_2 eq)*
I.1.1.	1.D.3. CO_2 emissions from biomass	Table1	CO_2	2022	1 417.22	1 455.06	–37.85	kt	–2.6	–37.85
I.1.2.	2.D.3. Other	Table2(I)	CO_2	1990	12.23	16.23	–4.01	kt	–24.7	–4.01
I.1.3.	3.D.2. Indirect N_2O emissions from managed soils	Table3	N_2O	1990	0.22	0.09	0.13	kt	140.6	33.71
I.1.4.	3.D.2. Indirect N_2O emissions from managed soils	Table3	N_2O	2022	0.15	0.07	0.08	kt	114.1	21.74
I.1.5.	4.A.2. Land converted to forest land	Table4	Net CO_2 emissions/removals	1990	–43.17	–32.55	–10.62	kt CO_2 eq	–32.6	–10.62
I.1.6.	4.B.2. Land converted to cropland	Table4	Net CO_2 emissions/removals	1990	78.04	44.77	33.27	kt CO_2 eq	74.3	33.27
I.1.7.	4.C.2. Land converted to grassland	Table4	Net CO_2 emissions/removals	1990	–68.72	–34.81	–33.91	kt CO_2 eq	–97.4	–33.91
I.1.8.	4.E.2. Land converted to settlements	Table4	Net CO_2 emissions/removals	1990	42.98	29.22	13.76	kt CO_2 eq	47.1	13.76
I.1.9.	4.B.1. Cropland remaining cropland	Table4	Net CO_2 emissions/removals	2022	–75.78	2.60	–78.38	kt CO_2 eq	–3 013.7	–78.38
I.1.10.	4.B.2. Land converted to cropland	Table4	Net CO_2 emissions/removals	2022	0.79	34.10	–33.31	kt CO_2 eq	–97.7	–33.31
I.1.11.	4.C.2. Land converted to grassland	Table4	Net CO_2 emissions/removals	2022	–4.79	–17.64	12.85	kt CO_2 eq	72.9	12.85
I.1.12.	4.E.2. Land converted to settlements	Table4	Net CO_2 emissions/removals	2022	27.92	22.60	5.31	kt CO_2 eq	23.5	5.31
I.1.13.	5.A.1. Managed waste disposal sites	Table5	CH_4	2022	1.75	1.58	0.18	kt	11.2	4.96

Table I.2
Findings on completeness

ID#	*Sector, category or gas*	*CRT*	*Gas*	*Inventory year*	*Notation key*	*Finding type*
I.2.1.	5.F.1. Long-term storage of carbon in waste disposal sites	Table5	CO_2	1990	NE	Reporting of “NE” detected
I.2.2.	5.F.1. Long-term storage of carbon in waste disposal sites	Table5	Total GHG emissions	1990	NE	Reporting of “NE” detected
I.2.3.	5.F.2. Annual change in total carbon storage	Table5	CO_2	1990	NE	Reporting of “NE” detected
I.2.4.	5.F.2. Annual change in total carbon storage	Table5	Total GHG emissions	1990	NE	Reporting of “NE” detected
I.2.5.	5.F.3. Annual change in total carbon storage in HWP waste	Table5	CO_2	1990	NE	Reporting of “NE” detected
I.2.6.	5.F.3. Annual change in total carbon storage in HWP waste	Table5	Total GHG emissions	1990	NE	Reporting of “NE” detected
I.2.7.	5.F.1. Long-term storage of carbon in waste disposal sites	Table5	CO_2	2023	NE	Reporting of “NE” detected
I.2.8.	5.F.1. Long-term storage of carbon in waste disposal sites	Table5	Total GHG emissions	2023	NE	Reporting of “NE” detected
I.2.9.	5.F.2. Annual change in total carbon storage	Table5	CO_2	2023	NE	Reporting of “NE” detected
I.2.10.	5.F.2. Annual change in total carbon storage	Table5	Total GHG emissions	2023	NE	Reporting of “NE” detected
I.2.11.	5.F.3. Annual change in total carbon storage in HWP waste	Table5	CO_2	2023	NE	Reporting of “NE” detected
I.2.12.	5.F.3. Annual change in total carbon storage in HWP waste	Table5	Total GHG emissions	2023	NE	Reporting of “NE” detected
I.2.13.	PFCs	Table10s6	–	1990	NA, NO	Gas or sector not reported
I.2.14.	PFCs	Table10s6	–	2023	NA, NO	Gas or sector not reported
I.2.15.	Unspecified mix of HFCs and PFCs	Table10s6	–	1990	NO	Gas or sector not reported
I.2.16.	Unspecified mix of HFCs and PFCs	Table10s6	–	2023	NO	Gas or sector not reported
I.2.17.	NF_3	Table10s6	–	1990	NO	Gas or sector not reported
I.2.18.	NF_3	Table10s6	–	2023	NO	Gas or sector not reported
I.2.19.	6. Other	Table10s6	–	1990	NA, NO	Gas or sector not reported
I.2.20.	6. Other	Table10s6	–	2023	NA, NO	Gas or sector not reported

Table I.3
Changes in notation keys reported since the previous submission

ID#	*Category*	*CRT*	*Gas*	*Inventory year*	*Notation key reported in latest submission (2025)*	*Notation key reported in previous submission (2024)*
I.3.1.	4.A.1. Forest land remaining forest land	Table4	CH_4	1990	NO	NE, NO
I.3.2.	4.A.1. Forest land remaining forest land	Table4	N_2O	1990	NO	NE, NO
I.3.3.	4.A.2. Land converted to forest land	Table4	CH_4	1990	NO	NE, NO
I.3.4.	4.A.2. Land converted to forest land	Table4	N_2O	1990	NO	NE, NO
I.3.5.	4.A.1. Forest land remaining forest land	Table4	CH_4	2022	NO	NE, NO
I.3.6.	4.A.1. Forest land remaining forest land	Table4	N_2O	2022	NO	NE, NO
I.3.7.	4.A.2. Land converted to forest land	Table4	CH_4	2022	NO	NE, NO
I.3.8.	4.A.2. Land converted to forest land	Table4	N_2O	2022	NO	NE, NO

Table I.4
Differences between the sectoral and reference approaches for the latest reported year

ID#	*CRT table*	*Fuel type*	*Description*	*Difference between reference and sectoral approaches (%)*
I.4.1.	Table1.A(c)	Other fossil fuels	Energy consumption	–16.2
I.4.2.	Table1.A(c)	Other fossil fuels	CO_2 emissions	–17.0

Table I.5
Findings on time-series consistency

ID#	*Category*	*CRT*	*Gas*	*Year 1*	*Year 2*	*Value 1*	*Value 2*	*Difference*	*Unit*	*Difference (CO_2 eq)*	*Difference (%)*	*Z-score*
I.5.1.	1.A.1.a. Public electricity and heat production	Table1	CO_2	2001	2002	279.69	1 025.27	745.58	kt	745.58	266.6	4.2
I.5.2.	1.A.2.a. Iron and steel	Table1	CO_2	1994	1995	4 046.75	2 297.21	–1 749.54	kt	–1 749.54	–43.2	–4.1
I.5.3.	1.A.2.b. Non-ferrous metals	Table1	CO_2	1995	1996	36.74	59.05	22.31	kt	22.31	60.7	3.6
I.5.4.	1.A.2.d. Pulp, paper and print	Table1	CO_2	2020	2021	0.40	13.82	13.42	kt	13.42	3 339.2	3.2
I.5.5.	1.A.2.e. Food processing, beverages and tobacco	Table1	CO_2	2002	2003	25.76	15.46	–10.30	kt	–10.30	–40.0	–3.0
I.5.6.	1.A.2.g. Other	Table1	CO_2	1990	1991	96.29	228.07	131.78	kt	131.78	136.9	3.3
I.5.7.	1.A.2.g. Other	Table1	CO_2	1999	2000	378.52	238.34	–140.17	kt	–140.17	–37.0	–3.8
I.5.8.	1.A.3.b. Road transportation	Table1	CO_2	2019	2020	6 100.48	4 561.55	–1 538.93	kt	–1 538.93	–25.2	–3.4
I.5.9.	1.A.3.b. Road transportation	Table1	N_2O	2019	2020	0.22	0.17	–0.05	kt	–12.57	–21.5	–4.1
I.5.10.	1.A.4.b. Residential	Table1	CO_2	1999	2000	703.63	1 070.14	366.51	kt	366.51	52.1	4.0

ID#	*Category*	*CRT*	*Gas*	*Year 1*	*Year 2*	*Value 1*	*Value 2*	*Difference*	*Unit*	*Difference (CO_2 eq)*	*Difference (%)*	*Z-score*
I.5.11.	1.A.4.c. Agriculture/forestry/fishing	Table1	CO_2	1999	2000	52.73	24.83	–27.90	kt	–27.90	–52.9	–4.6
I.5.12.	1.B.2.b. Natural gas	Table1	CH_4	2001	2002	1.33	1.91	0.58	kt	16.11	43.2	3.6
I.5.13.	1.D.3. CO_2 emissions from biomass	Table1	CO_2	2019	2020	1 172.23	1 445.77	273.54	kt	273.54	23.3	3.5
I.5.14.	2.A.1. Cement production	Table2(I)	CO_2	2022	2023	368.94	241.10	–127.84	kt	–127.84	–34.7	–3.2
I.5.15.	2.A.3. Glass production	Table2(I)	CO_2	2021	2022	31.45	2.36	–29.08	kt	–29.08	–92.5	–3.3
I.5.16.	2.C.1. Iron and steel production	Table2(I)	CO_2	1994	1995	770.83	465.38	–305.45	kt	–305.45	–39.6	–4.0
I.5.17.	2.D.3. Other	Table2(I)	CO_2	2007	2008	11.59	17.70	6.11	kt	6.11	52.7	3.5
I.5.18.	2.F.2. Foam blowing agents	Table2(I)	HFCs	1992	1993	4.36	10.31	5.95	kt CO_2 eq	5.95	136.6	3.6
I.5.19.	2.F.2. Foam blowing agents	Table2(II)	HFC-134a	1992	1993	3.35	7.93	4.58	t	5.95	136.6	3.6
I.5.20.	3.D.1.a. Inorganic N fertilizers	Table3	N_2O	2021	2022	0.18	0.11	–0.07	kt	–18.64	–40.0	–3.3
I.5.21.	3.D.2. Indirect N_2O emissions from managed soils	Table3	N_2O	2021	2022	0.19	0.15	–0.03	kt	–9.03	–18.1	–3.7
I.5.22.	4.A.1. Forest land remaining forest land	Table4	Net CO_2 emissions/removals	1991	1992	–77.88	–483.73	–405.85	kt CO_2 eq	–405.85	521.1	–3.3
I.5.23.	4.B.1. Cropland remaining cropland	Table4	Net CO_2 emissions/removals	2011	2012	–3.03	–23.12	–20.08	kt CO_2 eq	–20.08	662.5	–3.1
I.5.24.	4.B.1. Cropland remaining cropland	Table4	Net CO_2 emissions/removals	2013	2014	–37.28	–58.22	–20.94	kt CO_2 eq	–20.94	56.2	–3.3
I.5.25.	4.E.2. Land converted to settlements	Table4	Net CO_2 emissions/removals	2012	2013	30.25	45.34	15.09	kt CO_2 eq	15.09	49.9	4.1
I.5.26.	5.A.1. Managed waste disposal sites	Table5	CH_4	1993	1994	3.73	3.38	–0.35	kt	–9.81	–9.4	–3.3
I.5.27.	5.B.2. Anaerobic digestion at biogas facilities	Table5	CH_4	2022	2023	0.82	0.56	–0.26	kt	–7.20	–31.4	–4.2

Table I.6

Comparison between implied emission factors reported for key categories and the range of implied emission factors from the 2025 national inventory reports of developed country Parties

ID#	*Category*	*CRT*	*Gas*	*Unit*	*IEF reported*	*Comparison*
I.6.1.	2.A.1. Cement production	Table2(I).A-H	CO_2	t/t	0.467	Below range
I.6.2.	3.A.2.a. Other (please specify) – sheep	Table3.A	CH_4	kg CH_4/head/year	13.139	Above range
I.6.3.	3.A.4. Other livestock	Table3.A	CH_4	kg CH_4/head/year	0.905	Above range

Table I.7

Identification of new key categories

ID#	*New key category*	*Gas*	*Criteria*	*Inventory year*
I.7.1.	4.A.2. Land converted to forest land	CO_2	Trend	2023

ID#	New key category	Gas	Criteria	Inventory year
I.7.2.	4.B.1. Cropland remaining cropland	CO_2	Level	2023
I.7.3.	4.B.1. Cropland remaining cropland	CO_2	Trend	2023
I.7.4.	4.C.2. Land converted to grassland	CO_2	Trend	2023