Final Review Report

2025 Comprehensive Review of National Greenhouse Gas Inventory Data

pursuant to Article 38(1a) of Regulation (EU) No 2018/1999 and Article 4(4) of Regulation (EU) No 2018/841

Lithuania

28 August 2025

European Environment Agency

Reference: No 3502/B2025/EEA.60384

Contents

Introduction and conclusions from the 2025 comprehensive review 3
National totals for the purpose of Article 4(4) of Regulation (EU) 2018/841 (LULUCF) 5
Statement from Lithuania on the conclusions presented by the TERT 6
Recommendations from the TERT, considering revised estimates and technical corrections deemed necessary by the TERT 7
Revised estimates provided by Lithuania and accepted by the TERT[1] 21
Technical corrections deemed necessary by the TERT[1] 24
Annex I: Legal background and procedures of the 2025 comprehensive review 26
Annex II: Checks carried out during the 2025 initial checks and review 29

List of tables

Table 1: Overview of issues raised with Lithuania 4
Table 2 Totals net LULUCF emissions for the purpose of Article 4(4) of Regulation (EU) No 2018/841........... 5
Table 3: Recommendations from TERT (RE = Revised estimate; TC = Technical correction)........................... 7

Introduction and conclusions from the 2025 comprehensive review

This Final Review Report presents the findings from the 2025 comprehensive review of the greenhouse gas (GHG) emission inventory of Lithuania.

The comprehensive review was carried in accordance with Article 38(1a) of Regulation (EU) 2018/1999 ('Governance Regulation'). The purpose of the comprehensive review is to enable the Commission to set out the annual limit values of Lithuania for the years from 2026 to 2030, in terms of tonnes of CO_2 equivalent, as required by Article 4(4) of Regulation (EU) No 2018/841 (the 'LULUCF Regulation').

The reviewers carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the national GHG inventory for the years 2016, 2017 and 2018 as well as 2021, 2022 and 2023 submitted in 2025 by Lithuania pursuant to Articles 26(4) of the Governance Regulation.

The initial checks were carried out on the draft inventory submissions submitted pursuant to Article 26(3) of the Governance Regulation. The review builds on the initial checks performed by the EU inventory team (European Environment Agency (EEA) and the European Topic Centre on Climate Change Mitigation (ETC/CM)). The comprehensive review was performed by a Technical Expert Review Team (TERT).

More information on the procedures for the 2025 comprehensive review is presented in the annexes of this review report.

Initial check and comprehensive review conclusions

1. The reviewers raised 39 issues with Lithuania during the initial check and comprehensive review (see Table 1). The TERT provided recommendations for 25 of these issues. Other issues raised during the comprehensive review were clarified and are considered resolved.
2. The TERT identified cases where inventory data were prepared in a manner which is inconsistent with UNFCCC guidance documentation or Union rules. In particular, the TERT identified a number of under-estimates or over-estimates exceeding the threshold of significance pursuant to Article 31 of Commission Implementing Regulation (EU) No 2020/1208.
3. Lithuania provided 3 revised estimates to which the TERT agreed. Table 2 below summarises the revised estimates and further information is provided in the respective chapter of this report. The TERT did not agree to all revised estimates.
4. The TERT also deemed necessary technical corrections in the meaning of Article 38(2)(d) of Regulation (EU) No 2018/1999 and calculated such technical corrections in consultation with Lithuania. The technical corrections are presented in Table 2 of the present review report and are accompanied by evidence-based justification. In its response to the draft technical corrections, Lithuania stated that it agrees with the technical corrections.
5. The TERT identified recommendations in order to improve the national inventory data of Lithuania (see Table 3).
6. The TERT considers that it received a response from Lithuania that was sufficient in order to undertake the comprehensive review appropriately.

Table 1: Overview of issues raised with Lithuania

	Issues raised during the initial check	Issues raised during the comprehensive review	Recommendations	Revised estimates[1]	Technical corrections[2]
LULUCF	**14**	**25**	**25**	**3**	**2**

[1] Revised estimates: changes in inventory estimates triggered by the review and provided by the country.

[2] Technical corrections: changes in inventory estimates triggered by the review and provided by the TERT.

National totals for the purpose of Article 4(4) of Regulation (EU) 2018/841 (LULUCF)

Table 2 Totals net LULUCF emissions for the purpose of Article 4(4) of Regulation (EU) No 2018/841

Emission source category	Reference	Emission estimates (kt CO_2 equivalent)[1]					
		2016	**2017**	**2018**	**2021**	**2022**	**2023**
Total net greenhouse gas emissions for the LULUCF sector, pursuant to Article 26(4) of Regulation (EU) No 2018/1999	LTU-CRT-2025-V1-0-DataEntry-20250418-155130	-6 532.208	-5 879.471	-4 794.155	-5 411.475	-5 824.474	-5 254.678
Difference between revised estimates and original estimates provided by Lithuania and accepted by the TERT[2]							
4A2 Land converted to Forest land, CO_2, Living biomass (revision on biomass loss only)	LT-4A2-2025-0001	28.078	84.233	18.718	149.748	100.474	93.592
4A2 Land converted to Forest land, CO_2, Mineral soil	LT-4-2025-0009	176.475	174.400	166.849	170.986	170.325	176.949
4E2 Land converted to settlements, CO_2, Mineral soil	LT-4E2-2024-0002	-538.687	-424.356	-666.423	-524.997	-441.281	-604.486
Difference between technical corrections and original estimates deemed necessary by the TERT[2]							
4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils, CO_2, Organic soil	LT-4-2025-0005	14.349	14.156	14.349	21.748	28.919	7.210
4(III) Direct and indirect nitrous oxide (N_2O) emissions from nitrogen (N) mineralization/immobilization associated with loss/gain of soil organic matter, N_2O, Mineral soil	LT-4-2025-0011	-39.749	-32.130	-48.313	-39.030	-33.411	-44.706
Total net greenhouse gas emissions for the LULUCF sector including revised estimates and technical corrections		-6 891.742	-6 063.168	-5 308.974	-5 633.020	-5 999.448	-5 626.119

[1] The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals are taken into account.

[2] A positive difference indicates an increase compared to reported emissions or decrease in reported removals. A negative difference indicates a decrease compared to reported emissions or increase in reported removals. For more information on revised estimates and/or technical corrections, see Annex 1.

Statement from Lithuania on the conclusions presented by the TERT

Lithuania agrees with the aggregated GHG emission inventory estimates presented in Table 2.

Recommendations from the TERT, considering revised estimates and technical corrections deemed necessary by the TERT

Table 3: Recommendations from TERT (RE = Revised estimate; TC = Technical correction)

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
LT-4-2025-0005	No	4 Land use, land-use change and forestry, CO_2, 1990-2023	For 4(II)B2b Grassland converted to cropland (drainage of organic soils; CO_2, all years) the TERT noted that the areas provided for this subcategory in Table 4(II) were lower than the corresponding areas in Table 4B. In response to a question raised during the review, Lithuania acknowledged that the areas and the subsequent emissions for 4(II)B2b. were under-estimated due to an erroneous omission of some of the relevant NFI plots from the total area. Lithuania provided revised estimates (areas and emissions); however, the TERT noted an error in emission factor for CO_2 which was 4.8 t C/ha in the revised estimate, despite being given as 4.9 t C/ha in the NID. The TERT decided to calculate a technical correction for the years 2016, 2017, 2018, 2021, and 2022, which was accepted by Lithuania. The TERT notes that the technical correction is based on a correction of the original revised estimate provided by Lithuania. The estimates demonstrate that the issue is above the threshold of significance. The TERT recommends that Lithuania include a complete time series of revised estimate in its next submission.	TC
LT-4-2025-0009	Yes	4 Land use, land-use change and forestry, CO_2, 1990-2023	For 4A2 Land converted to forest land (mineral soils; CO_2, all years) the TERT noted that for conversions of Cropland and Grassland to Forest land (4A2a, 4A2b) different values of mineral soil carbon stocks (SOCs) were used for the calculation of the mineral SOC stock changes (NID, page 374) than those derived from a recent, comprehensive national study of SOC stocks that were implemented for the same land categories undergoing other conversions (Table 6-30 pg. 381). In response to a question raised during the review related to the general inconsistency in the SOC stocks quoted in the NID, Lithuania acknowledged the TERT's observations stating that it could not justify using different mineral SOC stocks for the same land category undergoing different conversions, and that the stocks used for conversions to Forest land had not yet been updated to the new stocks from the comprehensive national study. Lithuania provided a file containing recalculated estimates using harmonized, country-specific stock values. Lithuania subsequently provided revised estimates of mineral SOC stock changes for 4A2a Cropland converted to Forest land, 4A2b Grassland converted to Forest land for the years 2016, 2017, 2018, 2021, 2022 and 2023. The TERT agreed with the revised estimates provided by Lithuania. The TERT recommends that Lithuania include the revised estimates in its next submission and moreover revise the estimates for the whole time series. The TERT noted in	RE

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			the same observation also applies to Forest land on mineral soils from Wetlands, Settlements and Other land. The areas are not large and thus the potential biases (also due to the use of 'NE' notation key for conversions of Wetlands, as well as inconsistencies and inaccuracies in the mineral SOC stocks of Settlements, see LT-4E2-2024-0002) are below the threshold of significance. Nonetheless, noting the Annex V Part 3 of the Governance Regulation that at least Tier 1 methodologies in accordance with the 2006 IPCC Guidelines shall be used for all C pools, as well as the quality objectives of completeness, consistency, and accuracy, the TERT furthermore recommends that Lithuania estimate a complete time series of mineral SOC stock changes, using a consistent set of mineral SOC stock values, for all occurring conversions to Forest land, as well as all other occurring land conversion categories.	
LT-4-2025-0011	No	4 Land use, land-use change and forestry, N_2O, 2016, 2017, 2018, 2021, 2022, 2023	For 4(III)E2 Land converted to settlements (direct and indirect N_2O emissions from mineral SOM loss; N_2O, 2016, 2017, 2018, 2021, 2022, 2023) the TERT noted that, as observed for LT-4E2-2024-0002, the revised estimates of mineral soil carbon stock changes for 4E2 provided by Lithuania did not include revised estimates of the associated N_2O emissions. In response to a follow-up question during the review, Lithuania acknowledged the omission, but due to the tight timeframe given for revised estimates, Lithuania was not able to provide revised estimates for the associated direct and indirect N_2O emissions for 4(III)E2 Land converted to settlements. The TERT decided to calculate a technical correction for the years 2016, 2017, 2018, 2021, 2022 and 2023, which was accepted by Lithuania. The TERT notes that the technical correction is based on the revised estimates provided by Lithuania for the related observation LT-4E2-2024-0002. The estimates demonstrate that the issue is above the threshold of significance. The TERT recommends that Lithuania include a complete time series of revised estimate in its next submission.	TC
LT-4A2-2025-0001	Yes	4A2 Land converted to forest land, CO_2, 1990-2023	For 4A2 Land converted to Forest land (biomass; CO_2, all years) the TERT noted that for conversions of Cropland and Grassland to Forest land (4A2a, 4A2b) the NID, which outlined how forest growth (and biomass C stock gains) on afforestation areas is modelled, did not contain information on how or whether the calculation takes into account the initial biomass loss of previous land use. In response to a question raised during the review, Lithuania clarified that these losses are not included and acknowledged the TERT's observation that this causes an over-estimate on the net biomass stock gains in 4A2 that could exceed the threshold of significance. Lithuania provided a file containing recalculated estimates that indeed include this initial biomass losses. Lithuania subsequently provided revised estimates of biomass losses for 4A2a Cropland converted to Forest land, 4A2b Grassland converted to Forest land for the years 2016, 2017, 2018, 2021, 2022 and 2023. The TERT agreed with	RE

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			the revised estimates provided by Lithuania. The TERT recommends that Lithuania include the revised estimates in its next submission and moreover revise the estimates for the whole time series.	
LT-4E2-2024-0002	Yes	4E2 Land converted to settlements, CO_2, 1990-2023	For 4E2 Land converted to Settlements (mineral soils; CO_2) the TERT noted that, following on from the initial checks, mineral SOC stock changes for ongoing conversions of Forest land to Settlements were not reported for all years between 2016-2018 and 2021-2023 (e.g. in 2022, the notation key 'NO' is reported. The TERT followed up on the issue noting from Lithuania 's NID that the issue was partially the result of different transition periods: for Forest land conversions the stock change (net loss) is reported to occur in the year of the conversion only, while for other conversions (Cropland, Grassland) the default 20-year transition period was used (NID, page 428). Furthermore, the TERT noted from same section of NID that the methodology, which assumes all SOC of the previous land use is lost on/during land conversion, was neither consistent with the Tier 1- nor the Tier 2 methodologies outlined in Vol. 4 Ch. 8.3.3 of the 2006 IPCC Guidelines. Finally, via observation LT-4-2025-0009, the TERT noted from the NID that, as a general issue, different stock values were used for same land use category for different conversion categories. In response to a question raised during the review, Lithuania acknowledged the TERT's observations stating that it could not justify the methodologies that were applied and provided a file containing recalculated estimates using country-specific harmonized stock values, harmonized 20 year transition periods, as well as the 2006 IPCC default relative SOC change factors (0.8 and 1.14; Vol. 4 Ch. 8.3.3 of the 2006 IPCC Guidelines) to separately account for changes in mineral SOC stock in the sealed and non-sealed fractions of land converted to Settlements. Lithuania subsequently provided revised estimates of mineral SOC stock changes for 4E2a Forest land converted to Settlements, 4E2b Cropland converted to Settlements and 4E2c Grassland converted to Settlements for the years 2016, 2017, 2018, 2021, 2022 and 2023. The TERT agreed with the revised estimates provided by Lithuania. The TERT recommends that Lithuania include the revised estimates in its next submission and moreover revise the estimates for the whole time series. Noting the observation relates to a significant pool of a key category and furthermore noting the Annex V Part 3 of the Governance Regulation that at least Tier 2 methodologies in accordance with the 2006 IPCC Guidelines shall be used for such carbon pools of key categories, the TERT encourages Lithuania to develop and apply Tier 2 relative carbon stock change factors for calculating the mineral SOC changes in the sealed and non-sealed fractions of areas converted to Settlements.	RE
LT-4-2025-0004	No	4 Land use, land-use change and	For Land Representation affecting all gases, pools and years, the TERT noted that according to chapters 6.2 and 6.3 of the 2025 NID, areas of Forest land and non-forest land uses, as well as land-use changes, are monitored in Lithuania since 2012 using direct field classification at >16,000	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
		forestry, CH_4, CO_2, N_2O, 1990-2023	permanent NFI sample plots distributed over a 4x4 km systematic grid covering the entire territory. The TERT understands that since 2012, one fifth of the sample plots are visited each year and classified in situ, meaning that land use and land-use change at each NFI plot is classified once every five years. Based on the information provided in chapters 6.2 and 6.3 of the 2025 NID, the TERT understands that LU classification at NFI plots actually began in 1998; however, only at a subset of 5,600 Forest land NFI plots, again sampled over a five-year cycle. Importantly, the TERT acknowledges two studies (Study 1, “Forest land changes in Lithuania 1990-2011”; Study 2, “Changes of areas of Croplands, Grasslands, Wetlands, Settlements and Other lands in Lithuania during 1990-2011”referenced in the NID that were conducted to essentially expand (reconstruct) the time series of LU at all >16,000 permanent NFI sample plots back to 1990 following the five-cycle for each plot. The TERT infers from Figure 6.2 that this was done using photo interpretation at the plot locations using historical images but notes that beyond this figure and the cross reference to the two studies, no further methodological information is provided on this back-casting approach. The TERT therefore noted a lack of transparency regarding land representation and was unable to determine with confidence whether the estimates of land-use and land-use change are made in line with the Annex V part 3 of the Governance regulation (geographically explicit land-use conversion data in accordance with the 2006 IPCC Guidelines). In response to a question raised during the review, Lithuania responded with a detailed methodological description of how historical land-use at the NFI plots was reconstructed primarily through photo interpretation of orthophotos and other spatial imagery. This work was performed by trained specialists using standardised classification protocols to reduce interpretative subjectivity and maintain classification consistency across all time periods. Where possible, reconstructed LU classifications were cross-checked with available NFI field data, particularly from the early years of field inventory (starting 1998). This validation helped ensure that historical LU designations remained consistent with those observed in situ after 2012. Both major studies underpinning the reconstruction used GIS-based methods to digitize and interpret land-use boundaries. Analysis was performed at a spatial resolution of 1:10,000 (consistent with NFI precision requirements), which supported accurate land representation and minimised mapping error. Lithuania furthermore informed the TERT that Lithuania is undertaking a study aimed at developing a more detailed and spatially refined approach to LU representation. Also this new methodology is being designed to meet the data requirements set out in Annex V, Part 3 of the EU Governance Regulation (requirement to use geographically explicit land-use conversion data). The goal is to enhance the robustness of LU change estimates and ensure full alignment with the most rigorous international reporting standards. The TERT thus concluded that Lithuania is applying geographically explicit land-use conversion data in accordance with the 2006 IPCC Guidelines as per the reporting requirements set out in Annex V part 3 of the Governance regulation. The TERT acknowledges the	

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			response to the question and the planned improvements, yet also notes that the original transparency issue can only be ultimately resolved by an improved methodological description in the NID of its next submission. Therefore, the TERT recommends that Lithuania transparently describe in the NID of its next submission how historical, pre-2012 land-use at all NFI plots was determined.	
LT-4-2025-0006	Yes	4 Land use, land-use change and forestry, CO_2, CH_4 and N_2O, 1990-2023	For 4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils (CO_2, CH_4 and N_2O; all years) the TERT noted that country-specific emission factors were used for emissions from drained organic soils. The TERT noted that except for references to the respective project (Life project OrgBalt; e.g. page 366 of the NID), the NID provided neither details on how the emission factors were derived nor references to the respective documentation. In addition to requesting this information, TERT furthermore asked if the derived CO_2 emission factors included the associated off-site DOC losses. With respect to the latter request, the TERT noted that according to the NID, Lithuania ’s inventory had been compiled in accordance with inter alia the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (see NID pages 14, 23 and 32). Lithuania provided the TERT with the requested information on how the emission factors were derived and furthermore clarified that 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands is incorrectly referenced in the NID on pages 14, 23, and 32, and is not being used in Lithuania’s LULUCF GHG inventory. For this reason, Lithuania justified that the calculation and reporting of the off-site DOC losses referred to in the 2013 Wetlands Supplement is not mandatory. The TERT thus noted that that the issue is below the threshold of significance for a technical correction. Nonetheless, the TERT recommends that Lithuania provide information in the NID of its next submission relating to how the emission factors were derived, providing respective references to the OrgBalt project publications/reports. The TERT furthermore recommends Lithuania to specify and justify in its next NID the omission of waterborne DOC losses from the estimated CO_2 emissions. Notwithstanding the above, the TERT encourages Lithuania with respect to drained organic soils to follow guidance in the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands.	No
LT-4-2025-0010	No	4 Land use, land-use change and forestry, CO_2, 1990-2023	For 4B2a Forest land converted to Cropland, 4C2a Forest land converted to Grassland, 4D2a Forest land converted to Wetlands, 4E2a Forest land converted to Settlements and 4F2a Forest land converted to Other land (Dead wood, CO_2, 1990-2023), the TERT noted from the NID (pages 363-365) that the associated dead wood losses are not reported under these respective categories. Instead included with the dead wood stock changes reported under 4A1 Forest land remaining Forest land. In response to a question raised during the review, Lithuania informed the TERT that it is working on a model solution that allows these dead wood losses to be explicitly estimated yet ensures consistency	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			with the national forest inventory (NFI) and no double-counting in the respective dead wood C stock changes in 4A1 Forest land remaining Forest land. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, the TERT concluded that the observation constituted a de facto comparability issue at the category level. The TERT notes that this is not in accordance with the 2006 IPCC Guidelines (vol. 4, chaps. 2 and 4, equations 2.4 and 2.5) because good practice requires Parties to estimate annual CO_2 net emissions/removals from the dead wood carbon pool of any land-use category as the annual net change in the resident carbon stock of the dead wood carbon pool in that land category. Given that lands undergoing land-use change belong to the category to which the land have been converted, losses of Forest land dead wood upon conversion to another category are to be reported under that land use category and not under 4A Forest land. The TERT therefore recommends that Lithuania calculate and report in its next submission the initial dead wood losses associated with reported deforestation under subcategories 4B2a Forest land converted to Cropland, 4C2a Forest land converted to Grassland, 4D2a Forest land converted to Wetlands, 4E2a Forest land converted to Settlements and 4F2a Forest land converted to Other land.	
LT-4B-2025-0001	No	4B1 Cropland remaining cropland, CH_4, N_2O, 1990-2023	For 4(IV)B1 Biomass burning on Cropland remaining Cropland (biomass; CH_4 and N_2O; all years), the TERT noted from the NID (page 392) that Lithuania uses the perennial biomass stock upon harvest (63 t C ha) as an input for wildfire emission estimates on perennial cropland under 4(IV)B using equation 2.27 of the 2006 IPCC Guidelines (Ch. 2 page 2.42). In response to a question raised during the review, Lithuania confirmed that this is indeed the case. The TERT concluded that the use of the biomass stock at maturity (63 t C ha) rather than the average stock across the rotation period (ca. 31.5 t C ha) very likely over-estimates emissions. The TERT noted that issue is below the threshold of significance for a technical correction. Nonetheless, the TERT recommends that Lithuania estimate C stock losses and non-CO_2 emissions from wildfires in Cropland remaining Cropland applying in its next submission an average perennial biomass stock, as well as calculate subsequent carbon stock gains, if perennial cropland is replanted, and report C stock losses and gains in CRT 4B while non-CO_2 emissions in CRT 4(IV).	No
LT-4B1-2025-0005	Yes	4B1 Cropland remaining cropland, CO_2, N_2O, 1990-2023	For 4B1 Cropland remaining Cropland (mineral soils, CO_2 and N_2O, 1990-2023), the TERT noted that the NID provides information on the mineral soil carbon stock values and relative stock change values used for the calculation (pages 387-390); however, the TERT notes a lack of transparency on the methodology. The NID does not provide a figure or table on the areas of the relevant cropland management systems (organic cropland, perennial cropland with no tillage and other) over time. Furthermore, there is no description of how calculations with the respective areas and the given factors are implemented i.e. the equations applied. In response to a question raised during the	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			review, Lithuania provided the TERT with the necessary information and data to demonstrate how the calculations were implemented. The TERT furthermore noted that the input factor (Fi) of 1.44 applied to certified organic farming led to calculated mineral SOC stock changes in the last decade that are very high and lie much higher above the distribution of implied stocks changes reported by the other Member States for Cropland remaining Cropland. Lithuania followed up with a subsequent response explaining why the Fi of 1.44 was selected, noting the main assumption behind this decision is that Lithuania manure is being used for fertilisation of certified organic cropland. The TERT notes that this issue does not relate to an over- or under-estimate of emissions and acknowledges the planned improvement. Nonetheless, the TERT concluded that the observation constituted a transparency issue. The TERT therefore recommends that Lithuania enhance transparency in the NID of its next submission with regard to the mineral soil calculations for 4B Cropland remaining Cropland. Specifically, the TERT recommends reporting the underlying activity data with respect to changes in cropland management and describing with equations how the methodology was implemented. Furthermore, the TERT recommends that Lithuania include an explanation of the selection of management and input factors used to calculate the mineral soil C stock changes associated with these measures.	
LT-4B1-2025-0002	Yes	4B1 Cropland remaining cropland, CO_2, 1990-2023	For 4B1 Cropland remaining Cropland (biomass, CO_2, 1990-2023), the TERT noted that for perennial croplands Lithuania provides in its NID (page 386) information on the stocks at harvest and rotation periods used for Orchards (IPCC Tier 1) and those used for Willow and Poplar plantations (country-specific). The NID however provides neither the areas of these perennial croplands nor information on how these stock and rotation values are implemented to calculate gains and losses over the time series for perennial cropland remaining perennial cropland. In response to a question raised during the review, Lithuania provided the TERT with the necessary information and data to demonstrate how the calculations were implemented. The TERT notes that this issue does not relate to an over- or under-estimate of emissions and acknowledges the planned improvement. Nonetheless, the TERT concluded that the observation constituted a transparency issue. The TERT therefore recommends that Lithuania enhance transparency in the NID of its next submission with regard to the biomass C stock change calculations for 4B Cropland remaining Cropland. Specifically, the TERT recommends reporting the underlying activity data with respect to changes in perennial cropland areas and describing with equations how the methodology was implemented to estimate C stock changes.	No
LT-4B1-2024-0001	Yes	4B1 Cropland remaining	For 4B1 Cropland remaining Cropland (Biomass, CO_2, 1990-2023), the TERT noted the category-specific planned improvement chapter in the 2025 NID (6.5.6) and requested further details on these specific ongoing improvements e.g. have national studies been initiated or has research of national	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
		cropland, CO_2, 1990-2023	and international literature and/or the NIRs/NIDs of similar/neighbouring countries yielded promising data for developing Tier 2 methods for the biomass pool of Cropland remaining Cropland. In response to this question, Lithuania referred to the cooperation with the Lithuanian Research Centre for Agriculture and Forestry (LAMMC), where experts are engaged to support the transition to higher-Tier methodologies for the Cropland remaining Cropland living biomass (orchards) carbon pool. Lithuania detailed that the initial plan is to review national scientific literature. If relevant data are not available, methodologies from neighbouring or geographically similar countries will be analysed. LAMMC experts will advise on the suitability of applying these methodologies to Lithuanian estimates. Based on a preliminary review of other countries' approaches, Lithuania informed the TERT that it had found that Denmark and Finland use country-specific carbon stock factors for orchard trees. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, noting Annex V Part 3 of the Governance Regulation that at least Tier 2 methodologies shall be used for a carbon pool contributing at least 25% of the emissions or removals in a source or sink category that is identified as a key category, the TERT recommends that Lithuania apply a higher Tier methodology for the living biomass carbon stock changes of 4B1 Cropland remaining Cropland.	
LT-4B1-2025-0003	Yes	4B1 Cropland remaining cropland, CO_2, CH_4 and N_2O, 1990-2023	For 4B1 Cropland remaining Cropland (all pools, all GHGs, all years), the TERT noted from the NID (page 388) that Lithuania is unable to track land conversions between cropland management practises. In response to a question raised during the review asking if land conversions between annual and perennial cropland are not estimated, Lithuania clarified that the sentence in question referred to tracking conversions between sustainable agricultural practices - no-till, cover crops and eco-farms- and that conversions between annual and perennial cropland are being estimated. The TERT however noted from a response to another observation (LT-4B1-2025-0002) and from the calculation file attached demonstrating how biomass stock changes in Cropland remaining Cropland are calculated, that these conversions are not explicitly calculated. Instead, the total area of perennial cropland is subtracted from total Cropland remaining Cropland area, thus inferring that changes in perennial cropland area are due only to conversions from annual cropland. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, noting a transparency issue, the TERT recommends that Lithuania explicitly describe in the NID of its next submission that the conversions between annual and perennial cropland are not explicitly estimated but are rather inferred from the changes in total perennial cropland areas, assuming the changes in total area are related to conversions from/to annual cropland. Furthermore, the TERT recommends that at least for the soil organic carbon pool of mineral soils Lithuania estimate carbon stock changes associated to changes in management practices, as per IPCC Tier 1 method.	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
LT-4B2-2025-0002	Yes	4B2 Land converted to cropland, CO_2, 1990-2023	For 4B2b Grassland converted to Cropland (dead organic matter, CO_2, 1990-2023), the TERT noted that the previous UNFCCC review of the 2022 submission highlighted an issue (L.3) that dead organic matter (DOM) losses from Grassland converted to annual cropland occur; however, for Grassland converted to perennial cropland, the change in DOM is not estimated. Lithuania responded to that review that it was considering a literature review/expert judgement to come up with a DOM stock for perennial cropland. Lithuania reports in its 2025 NID under methodological aspects that it is planned to conduct the above literature review (page 394) but does not provide further specific details of plans and progress in e.g. the chapter on category-specific improvements (6.5.5, page 401). In response to a question raised during the review, Lithuania informed the TERT of the cooperation with the Lithuanian Research Centre for Agriculture and Forestry (LAMMC), where experts are employed to answer this question. However, Lithuania communicated that at the moment Lithuania does not have preliminary findings to share with the TERT. However, it is expected to get DOM values for perennial croplands in the 2025-2026 period. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, the TERT recommends that Lithuania resolve this issue, and develop and estimate DOM stock changes in Grassland converted to perennial cropland when data will be available.	No
LT-4B2-2025-0001	Yes	4B2 Land converted to cropland, CO_2, 1990-2023	For 4B2b Grassland converted to Cropland (Biomass, CO_2, 1990-2023), the TERT noted from the NID, that Lithuania uses IPCC 2006 Tier 1 default Grassland biomass stock values for the loss of Grassland upon conversion to Cropland. The category-specific improvement chapters for Cropland and Grassland (pages 400-401, and 415) made no mention of ongoing work to derive higher Tier methodologies for estimating Grassland biomass stocks and stock losses upon conversion. In response to a question raised during the review, Lithuania informed the TERT that a national study has now developed country-specific biomass carbon stocks for Cropland and Grassland; however, the values were not provided in time for the current 2025 submission. The TERT notes that this issue does not relate to an over- or under-estimate of emissions and acknowledges the planned improvement. Nonetheless, the TERT also notes that biomass of Grassland converted to Cropland is a significant pool contributing up to |42%| of the category CO_2 emissions. Recalling Annex V Part 3 of the Governance Regulation, that at least Tier 2 methodologies shall be used for a carbon pool contributing at least 25% of the emissions or removals in a source or sink category that is identified as a key category, the TERT recommends that Lithuania develop and apply a higher Tier methodology for estimating the biomass C stock changes caused by 4B2b Grassland converted to Cropland, and that the derived country-specific Cropland and Grassland biomass stocks are applied consistently to the other relevant subcategories of the inventory.	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
LT-4B2-2024-0001	Yes	4B2 Land converted to cropland, CO_2, 2022, 2023	The TERT noted inconsistencies between the areas reported in CRT 4.1 and the respective areas and carbon stock changes reported in Table CRT 4B (this observation) and Table CRT 4D (EMRT ID: LT-4-2025-0002). The respective area values should of course not be the same, however the TERT noted cases where the 20-year conversion areas for Forest land converted to Cropland under Table 4B in 2023 were the same as the annual areas reported for 2023 in Table 4.1, despite such annual conversions occurring in previous years e.g. CRT Table 4.1 for 2022. The TERT furthermore noted an inconsistency in the total managed Wetlands areas reported in CRT Tables 4.1 and 4.D (LT-4-2025-0002). In response to questions raised during the review, Lithuania acknowledged and explained the mistakes in the respective CRT entries and responded that the mistakes will be corrected in the next submission. The TERT concluded this issue did not relate to an over- or under-estimate of emissions above the threshold of significance. Nonetheless, the TERT recommends that Lithuania in its next submission ensure consistency and accuracy in the respective land use and land-use change areas reported in CRT Table 4.1 and CRT Tables 4A-4F.	No
LT-4D1-2025-0001	No	4D1 Wetlands remaining wetlands, CO_2, 1990-2023	For 4D1a Peat extraction remaining Peat extraction (organic soils, CO_2, 1990-2023), the TERT noted from the NID (ch. 6.7.2, pages 416-418) that Lithuania uses the IPCC Tier 1 CO_2 emission factor for off-site emissions. Noting that 4D Wetlands: CO_2 is a key category and extracted peat is a significant pool, the TERT requested Lithuania to provide information on ongoing or planned improvements to implement a higher Tier methodology for this source. Lithuania responded that the inventory agency has a contract with the Lithuanian Research Centre for Agriculture and Forestry (LAMMC), where experts are employed to answer this question. Unfortunately, at the moment Lithuania does not have preliminary data about moving towards Tier 2. However, it is expected, that the NIDs of neighbouring countries will be analysed, when preparing national EF's for Peat extraction sites. Moreover, at 2025-2026 period these national values for peat extraction sites remaining peat extraction sites will be presented and thus included in the NID and CRT. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, noting Annex V Part 3 of the Governance Regulation that at least Tier 2 methodologies shall be used for a carbon pool contributing at least 25% of the emissions or removals in a source or sink category that is identified as a key category, the TERT recommends that Lithuania apply a higher Tier methodology for estimating off-site CO_2 emissions from 4D1a Peat extraction remaining peat extraction.	No
LT-4D1-2025-0002	No	4D1 Wetlands remaining wetlands, CO_2, 1990-2023	For 4D1a Peat extraction remaining Peat extraction (organic soils, CO_2, 1990-2023), the TERT noted that chapter 6.7.2 of the NID (pages 416-418) describes that the IPCC 2006 Tier 1 method is used and the subchapters reproduce all the necessary equations and provide information on which factors were used. The NID category chapter (6.7) however provides no explicit information on the source(s)	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			of activity data (peat extraction areas, areas of nutrient poor and nutrient rich peatlands, statistics on extracted peat etc.) as well as no time series of the quantitative information (tables/figures) of the activity data. In response to a question raised during the review, Lithuania acknowledged the need to improve transparency and provided the necessary information (split of nutrient rich and nutrient peat soils based on NFI, data sources - Lithuanian Geological Survey (LGS) for peat extraction areas and National Data Agency (NDA) for peat production statistics, to the TERT, as well as the time series of annual peat production activity data. The TERT therefore concluded that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, the TERT recommends that Lithuania transparently document and describe the trend in the respective peat production activity data, as well as the source(s) of the data, in the NID of its next submission.	
LT-4D2-2025-0001	No	4D2 Land converted to wetlands, CO_2, N_2O, 1990-2023	For 4D2. Land converted to Wetlands (organic and mineral soils, CO_2 and N_2O, 1990-2023), the TERT noted from the CRT Table 4D that the CO_2 emissions are driven entirely by the subcategory Land converted to Flooded land. The TERT noted that mineral soil C stock changes (losses upon flooding in the year of conversion) are estimated only for Forest land converted to Flooded land and not for other conversions to Flooded land e.g. Grassland converted to Flooded land. In response to a question raised during the review, Lithuania informed the TERT that it will improve the methodology and calculate and report the mineral soil carbon stock changes for all occurring conversions to Flooded land on mineral soils. The TERT notes that this issue does not relate to an over- or under-estimate of emissions and acknowledges the planned improvement. Nonetheless, the TERT concluded that the observation constituted a consistency and completeness issue. The TERT recommends that Lithuania calculate and report in the NID of its next submission the soil carbon stock changes associated with all occurring conversions to flooded land using the available country-specific SOC stock values e.g. for Grassland.	No
LT-4E2-2024-0001	Yes	4E2 Land converted to settlements, CO_2, 2021-2023	For 4E2 Land converted to Settlements (Biomass, CO_2, 2021-2023), the TERT noted that for the years 2021-2023, conversions of Cropland to Settlements occurred and are reported in Table 4.1, yet biomass losses are reported with the notation key 'NO' (not occurring). In response to a question raised during the review, Lithuania clarified that conversions in question related to conversion to urban green areas, and the omission was a mistake and that the CRT Table 4B for 2021-2023 should have included a small net gain in biomass. The TERT notes that this issue does not relate to a significant over- or under-estimate of emissions. Noting Annex V, Part 3 of the EU Governance Regulation that at least Tier 1 methodologies shall be used for all pools of all categories, the TERT recommends that Lithuania calculate and report in next submission the carbon stock changes in the biomass pool for all occurring conversions of Cropland to Settlements.	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
LT-4E2-2025-0002	Yes	4E2 Land converted to settlements, CO_2, 1990-2023	For 4E2 Land converted to Settlements (Biomass, CO_2, 1990-2023), the TERT noted from the NID page 427, that Tier 1 biomass stocks are used for the Cropland and Grassland biomass stock losses and furthermore Lithuania applies the IPCC Tier 1 methodology to biomass gains, assuming no subsequent gain in biomass C in urban vegetation. In response to question raised during the review, Lithuania noted that is working to develop and implement country-specific biomass stock values for the initial losses and is also considering to initiate an additional study to identify biomass stocks in settlements. The TERT notes that this issue does not relate to an over- or under-estimate of emissions and acknowledges the planned improvement. Nonetheless the TERT also notes that these biomass stock changes estimated with Tier 1 constitute a significant pool of a key category, contributing up to 34% and 30% of the category CO_2 emissions. Recalling Annex V Part 3 of the Governance Regulation, that at least Tier 2 methodologies shall be used for a carbon pool contributing at least 25% of the emissions or removals in a source or sink category that is identified as a key category, the TERT recommends that Lithuania develop and apply a higher Tier methodology for estimating the biomass C stock changes associated with 4E2 Land converted to Settlements.	No
LT-4E2-2025-0001	Yes	4 Land use, land-use change and forestry, CO_2, 1990-2023	For 4B2a Forest land converted to Cropland, 4C2a Forest land converted to Grassland, 4D2a Forest land converted to Wetlands, 4E2a Forest land converted to Settlements and 4F2a Forest land converted to Other land (Biomass, CO_2, 1990-2023), the TERT notes that biomass losses in the respective CRT Tables 4.B-4.F are reported with the notation key 'IE' (included elsewhere). These losses are included with the respective biomass stock changes reported under 4A1 Forest land remaining Forest land. In response to a question raised during the review, Lithuania informed the TERT that it is working on a model solution that allows these biomass losses to be explicitly estimated yet ensures consistency with the national forest inventory (NFI) and no double-counting in the respective biomass C stock changes in 4A1 Forest land remaining Forest land. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, the TERT concluded that the observation constituted a de facto comparability issue at the category level. The TERT notes that this is not in accordance with the 2006 IPCC Guidelines (vol. 4, chaps. 2 and 4, equations 2.4 and 2.5) because good practice requires Parties to estimate annual CO_2 net emissions/removals from the biomass carbon pool of any land-use category as the annual net change in the resident carbon stock of the biomass carbon pool in that land category. Given that lands undergoing land-use change belong to the category to which the land have been converted, losses of Forest land biomass upon conversion to another category are to be reported under that land use category and not under 4A Forest land. The TERT therefore recommends that Lithuania calculate and report in its next submission the initial biomass losses associated with deforestation under the occurring deforestation subcategories 4B2a Forest land converted to Cropland, 4C2a Forest land converted to Grassland, 4D2a	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
			Forest land converted to Wetlands, 4E2a Forest land converted to Settlements and 4F2a Forest land converted to Other land.	
LT-4F2-2025-0001	Yes	4F2 Land converted to other land, CO_2, N_2O, 1990-2023	For 4F2 Land converted to Other land (mineral soils, CO_2 and N_2O, all years) the TERT inferred from the CRT Tables that mineral SOC stock changes (losses) for Forest land converted to Other land occur in the year of conversion only while for conversions from other categories (Cropland and Grassland) mineral SOC stock changes occur over the default 20 year transition period. Lithuania clarified the issue explaining that these conversions of Forest land at three NFI plots relate to deforestation for military land use. Lithuania informed that mineral soil SOC is being observed in 0-30 cm soil horizon in this case, and NFI data, orthophotographs and in-situ checks show, that the top-most soil layer is being destroyed. Even though, that the 2006 IPCC Guidelines define a 20-year conversion period for such cases, the in-situ data shows, that this carbon pool was destroyed in 1 year, because of the specific military land use. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, due to the significant peaks in associated emissions (e.g the year 2018 where 4F2 emissions in CRT Table 4F were 727.63 kt CO_2; In 2019, 4F2 emissions in CRT Table 4F were 47.44 kt CO_2), the TERT recommends that Lithuania transparently explain and justify in the NID of its next submission, such cases where it deviates from the 2006 IPCC Guidelines, with respect to calculating mineral soil C stock changes over the different transition periods.	No
LT-4G-2025-0002	Yes	4G Harvested wood products, CO_2, 1900-2023	For 4G Harvest wood products (CO_2, 1990-2023), the TERT noted that the 2025 NID (chapter 6.10.2) reproduces the main equations used and states the source of the activity data, as well as half-life and carbon content factors. The NID does not explicitly define the start year for the historic Harvested Wood Products (HWP) calculations and the assumptions/methods used to extrapolate the production data back to this year. In response to questions raised during the review, Lithuania clarified that it has compiled a time series of harvested wood production starting from 1940 based on three data sources: FAOSTAT (1992–2025), scientific literature (1960–1991), and national statistical data (1940–1991). Lithuania furthermore clarified that it applies the 2006 IPCC Guidelines to extrapolate the HWP production values back to 1900 (Eq. 12.6, Vol. 4, Ch. 12). The TERT notes that this issue does not relate to an over- or under-estimate of emissions. Nonetheless, the TERT recommends Lithuania to increase transparency in the NID of its next submission with respect to the methodological descriptions relating to the 1940-onwards HWP time series and the extrapolation back to the start year of 1900 according to Eq. 12.6, Vol. 4, Ch. 12 of the 2006 IPCC Guidelines.	No
LT-4G-2025-0001	Yes	4G Harvested wood products, CO_2,	For 4G Harvested wood products (CO_2; 1997, 2012 and 2020), the TERT noted that annual net change in the pools of HWP produced and consumed domestically does deviate - at times considerably - from the balance between the respective gains and losses in those pools in the same table. The deviation	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2025 (RE/TC/no)
		1997, 2012, 2020	was noticed for the years 1997 and 2012 for Paper and paperboard IU, and 2020 for Solid wood IU. The TERT could not identify if the issue led to an over- or under-estimate of emissions in the years 2016-2018 to 2021-2023. In response to a question raised during the review, Lithuania clarified that the discrepancies identified in the HWP balance for the years 1997 and 2012 (Paper and Paperboard IU), as well as 2020 (Solid Wood IU), are due to cases where the reported export volume exceeds domestic production for the respective product category. As such, the over-estimated gains to the HWPs that are produced and exported are compensated – in the calculations at least – by negative gains to the same HWP pool that is produced and consumed domestically. Lithuania however informed the TERT that these negative gains are not reported as such in the CRT but are reported with the notation key ‘NO’ (not occurring). Noting that, at present, more accurate or detailed data on the origin of exported products are not available, Lithuania informed the TERT that it plans to contact the Customs Department and national statistics agency to obtain more granular information that could allow for better differentiation between domestically produced exports of HWPs and re-exported HWPs. The TERT acknowledges this planned improvement and recommends that Lithuania develop a methodology that filters out the “re-exported” fraction of exported HWPs, thus ensuring consistency between the reported annual net HWPs in CRT Table 4Gs1, and the balance between the respective gains and losses in those pools in the same table. The TERT furthermore encourages Lithuania to consider the possibility - after clarifying the accuracy of the annual statistics - that the issue is not caused by "re-exported" HWPs (export of imported HWPs) but rather is due to exports containing HWPs from the previous year(s). In such a case, it should be possible to balance this in those years with an additional loss from the domestically consumed HWPs and an associated gain in the exported HWPs. If so, the reporting of this additional loss from the domestically consumed HWP should be documented in the "Losses" cells of the CRT Table 4Gs1, rather than calculating a negative gain and reporting an ‘NO’ notation key in the "Gains" cells.	

Revised estimates provided by Lithuania and accepted by the TERT[1]

1

EMRT ID:	LT-4A2-2025-0001
EMRT URL:	https://emrt-esd.eionet.europa.eu/2025/LT-4A2-2025-0001
Country:	Lithuania
Land use category:	4A2 Land converted to Forest land
Gases:	CO_2
Pool:	Living biomass (revision on biomass loss only)
Completed by LULUCF Expert:	Bradley Matthews
Reviewed by Thematic Counterpart Expert:	
Reviewed by Lead Reviewer:	Sandro Federici
Reviewed by Quality Controller:	Justin Goodwin

The underlying problem:	Incompleteness - Biomass losses of Cropland and Grassland were not considered in the conversions to Forest land
Summarise the methodology used:	Revised estimate (Gains-Losses) calculated now with the initial losses of biomass of the previous land-use using the respective country stock values

2

	Original estimate (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	IE				Actually NO because not included
2017	IE				Actually NO because not included
2018	IE				Actually NO because not included
2021	IE				Actually NO because not included
2022	IE				Actually NO because not included
2023	IE				Actually NO because not included

	Revised Estimate received from country (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	28.078			28.078	
2017	84.233			84.233	
2018	18.718			18.718	
2021	149.748			149.748	
2022	100.474			100.474	
2023	93.592			93.592	

	Difference between RE and OE (kt CO_2e)			
Year	CO_2	CH_4	N_2O	Total GHG
2016	28.078			28.078
2017	84.233			84.233
2018	18.718			18.718
2021	149.748			149.748
2022	100.474			100.474
2023	93.592			93.592

EMRT ID:	LT-4-2025-0009
EMRT URL:	https://emrt-esd.eionet.europa.eu/2025/LT-4-2025-0009
Country:	Lithuania
Land use category:	4A2 Land converted to Forest land
Gases:	CO_2
Pool:	Mineral soil
Completed by LULUCF Expert:	Bradley Matthews
Reviewed by Thematic Counterpart Expert:	
Reviewed by Lead Reviewer:	Sandro Federici
Reviewed by Quality Controller:	Justin Goodwin

1

The underlying problem:	Inconsistencies in the application of country- specific mineral soil carbon stocks were identified as causing potential biases in the mineral soil carbon stock changes for Land converted to Forest land.
Summarise the methodology used:	Revised estimate calculated with the stock change method harmonising the use of the country-specific mineral SOC stocks for Cropland and Grassland conversion to Forest land

2

	Original estimate (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	-221.642			-221.642	
2017	-220.124			-220.124	
2018	-212.799			-212.799	
2021	-220.187			-220.187	
2022	-221.174			-221.174	
2023	-228.362			-228.362	

	Revised Estimate received from country (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	-45.166			-45.166	
2017	-45.724			-45.724	
2018	-45.950			-45.950	
2021	-49.201			-49.201	
2022	-50.848			-50.848	
2023	-51.413			-51.413	

	Difference between RE and OE (kt CO_2e)			
Year	CO_2	CH_4	N_2O	Total GHG
2016	176.475			176.475
2017	174.400			174.400
2018	166.849			166.849
2021	170.986			170.986
2022	170.325			170.325
2023	176.949			176.949

1	EMRT ID:	LT-4E2-2024-0002
	EMRT URL:	https://emrt-esd.eionet.europa.eu/2025/LT-4E2-2024-0002
	Country:	Lithuania
	Land use category:	4E2 Land converted to Settlements
	Gases:	CO_2
	Pool:	Mineral soil
	Completed by LULUCF Expert:	Bradley Matthews
	Reviewed by Thematic Counterpart Expert:	
	Reviewed by Lead Reviewer:	Sandro Federici
	Reviewed by Quality Controller:	Justin Goodwin
	The underlying problem:	Inconsistencies in transition periods, incompleteness in some occurring conversions ('NE'), as well as inconsistencies in the used country-specific mineral soil carbon stocks were identified as causing potential biases in the mineral SOC stock changes for Land converted to Settlements. For 4E2 Land converted to Settlements (mineral soils; CO_2) the TERT noted that, following on from the initial checks, mineral SOC stock changes for occurring conversions for Forest land converted to Settlements were not reported for all years between 2016-2018 and 2021-2023 (e.g. 2022, notation key 'NO', CRT Table 4E). The TERT followed up on the issue noting from Lithuania's NID that the issue was partially the result of different transition periods: for Forest land conversions the stock change (net loss) occurred in the year of the conversion, while for other conversions (Cropland, Grassland) the default 20-year transition period was used (NID, page 428). Furthermore, the TERT noted from same section of NID that the methodology, which assumes all SOC of the previous land use is lost on/during land conversion, was neither consistent with the Tier 1- nor the Tier 2 methodologies outlined in Vol. 4 Ch. 8.3.3 of the 2006 IPCC Guidelines. Finally, via observation LT-4-2025-0009, the TERT noted from the NID that, as a general issue, different stock values were used for same land use category for different conversion categories.
	Summarise the methodology used:	Revised estimate calculated with the stock change method harmonising the use of the mineral SOC stocks, transition periods (20 years), as well as completing calculations for all occurring conversions. Furthermore, the country also accounted for conversion areas leading to the sealed settlement areas and unsealed settlement areas, using respective Tier 1 factors (sealing, 08; and turfgrass, 1.44) provided by the IPCC 2006 Guidelines Vol Ch 8.

2

	Original estimate (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	647.622			647.622	
2017	532.460			532.460	
2018	775.002			775.002	
2021	630.791			630.791	
2022	547.146			547.146	
2023	709.792			709.792	

	Revised Estimate received from country (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	108.934			108.934	
2017	108.104			108.104	
2018	108.579			108.579	
2021	105.794			105.794	
2022	105.865			105.865	
2023	105.306			105.306	

	Difference between RE and OE (kt CO_2e)			
Year	CO_2	CH_4	N_2O	Total GHG
2016	-538.687			-538.687
2017	-424.356			-424.356
2018	-666.423			-666.423
2021	-524.997			-524.997
2022	-441.281			-441.281
2023	-604.486			-604.486

[1] Carbon stock changes (in kt C) from the CRT tables have been converted into kt CO_2 by multiplying by -44/12.

Technical corrections deemed necessary by the TERT[1]

1

EMRT ID:	LT-4-2025-0005
EMRT URL:	https://emrt-esd.eionet.europa.eu/2025/LT-4-2025-0005
Country:	Lithuania
Land use category:	4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils
Gases:	CO_2
Pool:	Organic soil
Completed by LULUCF Expert:	Bradley Matthews
Reviewed by Thematic Counterpart Expert:	
Reviewed by Lead Reviewer:	Sandro Federici
Reviewed by Quality Controller:	Justin Goodwin

The underlying problem:	Incompleteness - Some areas of drained organic soils on Grassland converted to Cropland were not considered in the reported estimates
Summarise the methodology used:	TC estimate with the revised and complete areas of drained organic soils on Grassland converted to Cropland (4(II)B2b) provided by Lithuania, but correcting the EF from 4.8 to 4.9 t C ha using the same EF from the NID

2

	Original estimate (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	322.858			322.858	
2017	330.226			330.226	
2018	351.557			351.557	
2021	380.032			380.032	
2022	387.210			387.210	
2023	437.415			437.415	

	Technical Correction calculated by TERT (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016	337.208			337.208	TC based on corrected revised estimate
2017	344.382			344.382	TC based on corrected revised estimate
2018	365.906			365.906	TC based on corrected revised estimate
2021	401.779			401.779	TC based on corrected revised estimate
2022	416.129			416.129	TC based on corrected revised estimate
2023	444.625			444.625	TC based on corrected revised estimate

	Difference between TC and OE (kt CO_2e)			
Year	CO_2	CH_4	N_2O	Total GHG
2016	14.349			14.349
2017	14.156			14.156
2018	14.349			14.349
2021	21.748			21.748
2022	28.919			28.919
2023	7.210			7.210

EMRT ID:	LT-4-2025-0011
EMRT URL:	https://emrt-esd.eionet.europa.eu/2025/LT-4-2025-0011
Country:	Lithuania
Land use category:	4(III) Direct and indirect nitrous oxide (N_2O) emissions from nitrogen (N) mineralization/immobilization associated with loss/gain of soil organic matter
Gases:	N_2O
Pool:	Mineral soil
Completed by LULUCF Expert:	Bradley Matthews
Reviewed by Thematic Counterpart Expert:	
Reviewed by Lead Reviewer:	Sandro Federici
Reviewed by Quality Controller:	Justin Goodwin

1

The underlying problem:	Lithuania provided revised estimates of mineral SOC stock losses for 4E2 land converted to Settlements, but did not provide the respective revisions of the associated direct and indirect N_2O emissions from SOM loss (4III)
Summarise the methodology used:	Reported total N_2O emissions of the category were simply scaled based on the changes in the estimates of mineral SOC changes 4E2 provided as revised estimates to the TERT (LT-4E2-2024-0002). Given that these emissions, assuming the same e.g. C:N ratios scale proportionally with mineral soil carbon stock losses 1:1, the TC was done in this way

	Original estimate (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016			47.787	47.787	
2017			40.315	40.315	
2018			56.185	56.185	
2021			46.895	46.895	
2022			41.427	41.427	
2023			52.494	52.494	

	Technical Correction calculated by TERT (kt CO_2e)				Notes
Year	CO_2	CH_4	N_2O	Total GHG	
2016			8.038	8.038	
2017			8.185	8.185	
2018			7.872	7.872	
2021			7.865	7.865	
2022			8.016	8.016	
2023			7.788	7.788	

2

	Difference between TC and OE (kt CO_2e)			
Year	CO_2	CH_4	N_2O	Total GHG
2016			-39.749	-39.749
2017			-32.130	-32.130
2018			-48.313	-48.313
2021			-39.030	-39.030
2022			-33.411	-33.411
2023			-44.706	-44.706

[1] Carbon stock changes (in kt C) from the CRT tables have been converted into kt CO_2 by multiplying by -44/12.

Annex I: Legal background and procedures of the 2025 comprehensive review

The LULUCF Regulation (EU) 2018/841 sets net emission removal targets for 2030 and net emission budgets in the period 2026 to 2029. In Article 4(5) of the LULUCF Regulation, the Commission is required to adopt decision setting out the annual limit values for net greenhouse gas removals for each year in the period from 2026 to 2029, for which it shall carry out a comprehensive review.

The Governance Regulation (EU) 2018/1999 lays down annual reporting obligations, compliance checks and a review process to ensure that the compliance with annual GHG emission limits is assessed in a credible, consistent, transparent and timely manner.

The requirements for the review of the national inventory data submitted by countries are set out in Article 38 of Regulation (EU) 2018/1999. The details concerning the review process, such as the timing and steps of conducting of the annual and comprehensive reviews are set out in Chapter V and Annex XXII of the Commission Implementing Regulation (EU) No 2020/1208.

The 2025 reviews were thus held as a comprehensive review in line with Article 38(1a) of Regulation (EU) 2018/1999in concert with the reviews required by the LULUCF Regulation.

Objectives

The objectives of the comprehensive review of countries' GHG emission inventories in 2025 are:

a) to support the European Commission by ensuring it has accurate, reliable and verified information on annual GHG emissions for
   - determining the budget for the period 2026-2029 according to Article 4(4) of Regulation (EU) 2018/841.

b) to assist countries in improving the quality of their GHG inventories.

Procedures

The scope of the 2025 comprehensive review is presented in Table A-1. The checks carried out during the 2025 comprehensive review are presented in Annex II.

The initial checks were carried out by the EEA with support from the ETC/CM. All findings from the initial checks that were partly resolved or not resolved within the initial check phase were followed up in the comprehensive review.

The EEA LULUCF experts consisted of the following experts:

- Sector experts: Raul Abad-Viñas and Peter Iversen (EEA)
- Quality coordinator: Lucia Perugini (EEA)

The comprehensive review 2025 was performed by a Technical Expert Review Team (TERT) under service contract **No 3502/B2025/EEA.60384** implementing Framework service contract No EEA/CET/24/002of the European Environment Agency. The lead reviewers and sector review experts did not review emission inventories of countries where these individuals have themselves contributed to the compilation of that inventory or presently are or have been any part of the decision-making process related to the compilation of that inventory.

The TERT consisted of the following experts:

- Iordanis Tzamtzis, Lora Stoeva, Rosie Brook, Carmen Schmid, Boštjan Mali, Andis Lazdiņš, Sven van Baren, Bradley Matthews, Valentin Bellassen, Aldis Butlers, Mattias Lundblad, Juan José Rincón Cristóbal, Etienne Mathias, Erwin Moldaschl and Mélanie Juillard;
- Lead reviewers: Peter Weiss, Kevin Black, Sandro Federici and Marina Vitullo.

The comprehensive review was coordinated by Bernd Gugele and Justin Goodwin.

The EEA review secretariat consisting of Claire Qoul, Lærke Callisen, Peter Iversen and Roxy Cottey prepared and coordinated the comprehensive review as foreseen in Article 30 of Commission Implementing regulation (EU) No 2020/1208 and Article 42 of the Governance Regulation (EU) 2018/1999.

The comprehensive review was performed on the basis 15 April submissions of GHG emission data and the national inventory document (NID) under the Governance Regulation.

Where relevant, the TERT calculated technical corrections for over- or under-estimates identified in a mandatory category in the countries' GHG inventories that exceed the threshold of significance. Technical corrections have been calculated only for the years 2016-2018 and 2021-2023. If the technical correction exceeds the threshold of significance for at least one year of the inventory under review (2021-2023) but not for all the years, the technical correction was calculated only for those years where the technical correction exceeds the threshold of significance.

Table A-1: Scope of the comprehensive review 2025

Element	Scope	Further information
Countries	EU geographical coverage of the Member States, Norway and Iceland	
Years	2016, 2017, 2018, 2021, 2022 and 2023	According to GovReg Article 38(1a) According to LULUCF Article 4(4)
Gases	CO_2, CH_4 and N_2O	
Sectors	LULUCF	

Annex II: Checks carried out during the 2025 initial checks and review

The checks carried out during the 2025 initial checks are pursuant to Article 37(4) of Regulation (EU) 2018/1999 and Article 6 of Commission Delegated Regulation (EU) 2020/1044 and the comprehensive review following Article 38(1a) of Regulation (EU) 2018/1999 and Article 30 of the Commission Implementing Regulation (EU) No 2020/1208.

Initial checks may include:

1. Assessment whether all emission source categories and gases required under Regulation (EU) No 2018/841 are reported;
2. Assessment whether emissions data time series are consistent;
3. Assessment whether implied emission factors across Member States/countries are comparable taking the IPCC default emission factors for different national circumstances into account;
4. Assessment of the use of 'Not Estimated' notation keys where IPCC Tier 1 methodologies exist and where the use of the notation key is not justified in accordance with point 32 of the Annex to Decision 18/CMA.1;
5. Analysis of recalculations performed for the inventory submission, including whether the recalculations are based on methodological changes;
6. Assessment whether issues from earlier Union initial checks and reviews as well as recommendations from UNFCCC reviews have been implemented by the Member State;
7. Assessment of the accuracy of Member States' emissions by sources and removals by sinks estimates in relation to Union key categories;
8. Assessment of the transparency and completeness of the methodological descriptions reported by Member States for the Union key categories;
9. Assessment of monitoring and reporting of emissions by sources and removals by sinks in the land use, land use change and forestry (LULUCF) sector pursuant to Part 3 of Annex V to Regulation (EU) 2018/1999, including the assignment of key categories, Tier methodology applied, and a comparison of reported land use and land use change activity data with information derived from the Union and Member State programmes and surveys.

Comprehensive review checks:

1. Detailed examination of the inventory estimates including methodologies used by the Member State in the preparation of inventories;
2. Detailed analysis of the Member State's implementation of recommendations related to improving inventory estimates as listed in its most recent UNFCCC annual review report made available to that Member State before the submission under review where recommendations have not been implemented;
3. Detailed analysis of the justification provided by the Member State for not implementing them;
4. Detailed assessment of the time series consistency of the greenhouse gas emissions estimates;
5. Detailed assessment whether the recalculations made by a Member State in the given inventory submission as compared to the previous one are transparently reported and made in accordance with the greenhouse gas inventory guidelines;
6. Follow-up on the results of the initial checks and on any additional information submitted by the Member State under review in response to questions from the technical experts review team and other relevant checks; -
7. Other relevant checks complementing the initial checks;
8. Check that all gases and pools are reported under LULUCF.