UNITED NATIONS

Distr.
GENERAL

CEIP/S3.RR/2023/
Romania
03/10/2023

ENGLISH ONLY

Report for the Stage 3 *ad-hoc* review of emission inventories submitted under the UNECE LRTAP Convention:

2023

Romania

FINAL REPORT

CONTENT

INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is given by the UNECE document 'Updated methods and procedures for the technical reviews of air pollutant emission inventories reported under the Convention'([1]) – hereafter referred to as the 'Review Guidelines 2018'.

2. Paragraph 7 (c) of the 'Review Guidelines 2018' defines that Stage 3 Reviews may be annual centralized reviews or ad hoc reviews. Paragraph 18 of the 'Review Guidelines 2018' further specifies that such ad hoc reviews could, for instance, focus on specific source sectors, specific pollutants such as heavy metals or persistent organic pollutants, gridded and projections data, or on other areas as requested by the Implementation Committee and that where appropriate, ad hoc reviews could be conducted in line with the present Methods and Procedures for the In-depth (Stage 3) review.

3. At its eighth joint session in September 2022, the Steering Body and the Working Group on Effects approved the plan that the in-depth review in 2023 focuses on emissions from agriculture with a special emphasis on ammonia, NMVOC and NO_x emissions including gridded data. While the focus was set on NH_3, NMVOC and NO_x emissions, also all other pollutants covered by LRTAP Convention and its protocols (i.e. SO_2, NOx, NMVOC, NH_3, plus PM_{10} $PM_{2.5}$, BC, priority HMs and POP_S) have been checked for the time series years 1990 – 2021 to the extent possible. For these other pollutants especially completeness of reporting was assessed.

4. This report covers the results of the Stage 3 Review (ad hoc review) 2023 of Romania's air emission inventory submitted under the UNECE LRTAP Convention. The review was coordinated by the EMEP Centre on Emission Inventories and Projections (CEIP) acting as Review Secretariat. The review took place between April and June 2023 and was performed as a desk review between 31 March to 5 May 2023 and an in-person meeting between 22 of May 2023 and 26 May 2023 (centralized review). The following team of nominated experts from the Roster of Experts performed the review.

Agriculture experts:

Ms. Armine ARTENYAN (Republic of Armenia)

Ms. Ajla BASOVIC (Montenegro)

[1] Decision 2018/1 adopted by EB: *Updated methods and procedures for the technical review of air pollutant emission Inventories reported under the Convention*. ECE/EB.AIR/142/Add.1 http://www.unece.org/fileadmin/DAM/env/documents/2002/eb/air/EB%20Decisions/Decision_2018_1.pdf

Ms. Aleksandra NESTOROVSKA-KRSTESKA (North Macedonia)

Mr. Lasha AKHALAIA (Georgia)

Mr. Hakam AL-HANBALI (Sweden)

Ms. Susana LOPEZ-APARICIO (EU/ETC(EEA))

Ms. Simone MAYER (Austria)

Ms. Andjelka RADOSAVLJEVIC (Serbia)

Ms. Kristina Tonhauzer (Slovakia)

Mr. Tim VAN DER ZEE (Netherlands)

Experts for gridded emission data:

Ms. Christine BRENDLE (Austria)

Mr. Christopher EVANGELIDES (United Kingdom)

Mr. Christian MIELKE (Germany)

5. Mr. Ben RICHMOND (United Kingdom), Ms. Rikke ALBREKTSEN (Denmark), Mr. Etienne MATHIAS (France), Ms. Kristina SAARINEN (Finland) were the lead reviewers. The review was coordinated by Ms. Sabine Schindlbacher and Mr. Bernhard Ullrich (EMEP Centre on Emission Inventories and Projections - CEIP).

6. The review was performed on the basis of CLRTAP emission data officially reported by Romania, due by 15 February 2023. The Informative Inventory Reports (IIR), reported due by 15 March 2023 under the CLRTAP, informed the review.

7. The EMEP/EEA Guidebook 2019[2] was used as a base for the review.

8. The emission inventory of Romania was received on 15 February 2023 and thus by the deadline of 15 February. The Informative Inventory Report was received on 15 March 2023 and thus by the deadline of 15 March. Romania provided a resubmissions of the emission inventory on 15 March 2023. The resubmission has been considered for the review.

[2] EMEP/EEA: EMEP/EEA air pollutant emission inventory guidebook 2019, EEA Report No. 13/2019 European Environment Agency, Copenhagen. Available at: https://www.eea.europa.eu/publications/emep-eea-guidebook-2019 EU 2019

PART A: GENERAL RECOMMENDATIONS FOR THE CHAPTER AGRICULTURE

9. The ERT recognises the level of effort undertaken by Romania in providing an inventory including a significant level of detail.

The IIR describes the methods used for the sector agriculture transparently enough. The ERT considers the agriculture part of the inventory submission to be of adequate quality in terms of completeness and of adequate quality in terms of accuracy, comparability and consistency.

To improve the overall quality of the agriculture air emission inventory the ERT recommends Romania to:

- provide a chapter describing the methods used to generate the gridded data in the next submission of the IIR
- provide gridded emission data according to the deadlines set up in the UNECE reporting Guidelines
- provide a detailed description of applied methodologies, data sources, choice of emission factors and activity data for all categories in the IIR.
- provide a detailed description of interannual variations where it would improve the transparency for the reader.
- ensure that the agriculture emission inventory is complete, by ensuring that also emissions of other pollutants, e.g., HCB emissions from 3Df – use of pesticides, are included.
- follow up on planned improvements and implement these into the inventory at the earliest possible submission.

PART B: SPECIFIC RECOMMENDATIONS FOR THE SECTOR AGRICULTURE

10. Table 1 provides the findings from the 2023 CLRTAP Stage 3 Review including those not implemented from previous CLTRAP Stage 3 Reviews. While the focus was set on NH_3, NMVOC and NO_x emissions, also all other pollutants covered by the LRTAP Convention and its protocols (i.e. SO_2, NOx, NMVOC, NH_3, plus PM_{10} $PM_{2.5}$, BC, priority HMs and POP_S) have been checked for the years 1990 – 2021 to the extent possible, especially regarding the completeness of reporting. The implementation of the recommendations will be followed up in a future CLRTAP inventory review.

Table 1: Findings from the CLRTAP Stage 3 Review 2023 for the Sector Agriculture[3]

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC$_1$C$_2$C$_3$
RO-2023-3B-1	All	3B	Yes	Tier 2	R	T
Observation The ERT noticed that the IIR lacks detailed description on the sources and input data behind the activity data. For instance, the IIR refers to a questionnaire at local level used to collect activity data for manure management (3B4giii and 3B4giv). Romania responded that the questionnaire is sent by local agencies to the farmers. The questionnaires provide data on the annual average number of poultry heads: (NFR 3B4giii) Turkeys and (NFR 3B4giv) Other poultry. For other poultry category, it was explained that this category refers to any other poultry except laying hens, broilers and turkeys. **Recommendation** **The ERT recommends Romania to include more detailed information on the questionnaire (e.g., % response, coverage, time span it represents, etc.) in the 2023 submission to enhance the quality of the IIR and contribute to improved transparency.**						
ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC$_1$C$_2$C$_3$
RO-2023-3B-2	NMVOC	3B	Yes	Tier 2	R	T
Observation In the same line as with RO-2023-3B-2, the ERT emphasizes the lack of detailed description on the sources and input data behind the activity data. The IIR states that for the estimates of NMVOC emissions, "The percent of silage feeding for dairy cattle, non-dairy cattle (10%), sheep,						

[3] Note: There are four possible types of findings: R: Recommendation, TC: Technical Correction, PTC: Potential Technical Correction; RE : Revised Estimate

The findings have been assigned to one or more of the following criteria: TACCC T (Transparency), A (Accuracy), C_1 (Completeness), C_2 (Comparability), C_3 (Consistency) for definitions of these criteria see EMEP/EEA Guidebook 2019

goats and buffalos (3%) according to the study “Romanian Projections for Pollutants Emissions to 2030” was used in calculation". However, neither details on the basis for these values nor the study was included in the reference list. Romania responded with the detailed information from the mentioned study, and that they would include the study in the reference list.

Recommendation

The ERT recommends Romania to add the detailed information behind the percentage of silage feeding for the different livestock in the IIR in the 2023 submission, in addition to including the previously mentioned study in the reference list to enhance the quality of the IIR and contribute to improved transparency.

ID	Pollutants	NFR category	Key Category	Tier level used for KC	Type	$TAC_1C_2C_3$
RO-2023-3B-3	HCB	3Df	-	-	R	C_1

Observation

The ERT noticed that HCB emissions from pesticides (3Df) are not reported while a Tier 1 method is available in the EMEP/EEA Guidebook. In addition, the Stage 3 reviewed report (2013) for Romania strongly recommended that Romania report emission estimates from pesticide use in next submission. However, no information about pesticides was included in the IIR, and the notation NA was found in the IIR. Romania responded that in the next submissions, NE will be used instead of NA, and that further analysis is required to assess activity data for 3Df.

Recommendation

The ERT encourages Romania to carry out the needed analysis to assess activity data and estimate HCB emissions from pesticides (3Df) for the 2023 submission. If this is not possible, then the ERT recommends Romania to use the notation key ‘NE’.

ID	Pollutants	NFR category	Key Category	Tier level	Type	$TAC_1C_2C_3$
RO-2023-3B-4	NH_3	3B3	Yes	Tier 2	R	T

Observation

The ERT noticed a major time series inconsistency with a dip in 2001 in NH_3 from 3B3 Manure management – Swine, and the reason for these notable interannual variation in the time series was not described in the IIR. During the review, Romania provided a detailed description for such variations, which are mainly associated with changes in the number of swine heads and economic changes in the country over time.

Recommendation

The ERT recommends Romania to include in the IIR the analysis and reasons of the interannual variations in NH_3 from manure management - swine, which is a key category, to enhance the quality of the reporting and contribute to transparency.

PART C: SPECIFIC RECOMMENDATIONS FOR THE GRIDDED EMISSION DATA FOR THE SECTOR AGRICULTURE

11. For the 2023 Review of the gridded emission data the focus was set on NH_3, NMVOC, NO_x and $PM_{2.5}$ emissions.

12. The methods used by Romania to spatially resolve sectoral emissions are not described transparently enough in the IIR.

13. The description does not include data sources that have been used for spatial distribution.

14. Gridded emissions reported for GNFR K_AgriLivestock and L_AgriOther are consistent with the corresponding NFR categories reported in Annex I.

15. Table 2 provides the findings from the ERT related to the gridded data.

16. The implementation of the recommendations will be followed up in a future CLRTAP inventory review.

Table 2: Findings from the CLRTAP stage 3 review 2023 for gridded emissions from the sector agriculture[4]

ID	Pollutants	GNFR category	$TAC_1C_2C_3$
RO-2023-GRID-GL-1	All supplied	GNFR-K&L	TC_1
Observation The expert review team notes that there is no gridded emission data available for the year 2019 and that there is a lack of transparency regarding the methods used to generate the gridded data. **Recommendation** **The expert review team recommends Romania to provide gridded emission data according to the deadlines set up in the UNECE reporting Guidelines and to provide a chapter describing the methods used to generate the gridded data in the next submission of gridded data.**			

[4] The findings have been assigned to one or more of the following criteria: TACCC T (Transparency), A (Accuracy), C_1 (Completeness), C_2 (Comparability), C_3 (Consistency) for definitions of these criteria see EMEP/EEA Guidebook 2019

REVISED ESTIMATES AND TECHNICAL CORRECTIONS CONSIDERED AND/OR CALCULATED BY ERT

17. In the Appendix of the 'EMEP/UNECE Review Guidelines 2018[5]' it is stated that if the ERT considers that emissions are significantly under- or overestimated, the Party is during the review invited to submit 'Revised Estimates' that address the issue raised. Should the Party decline to do this, or should it not be possible to agree on the quantification of a Revised Estimate i.e. the ERT does not accept a Revised Estimate provided by the Party, the ERT may calculate a 'Technical Correction'. The threshold for significance for a Technical Correction for the in-depth review in 2023 was set at 2% of the national total, i.e. a finding that has been identified to result in an over- or under-estimate of emissions of more than 2% of the national total. The methods for calculating Technical Corrections are set up in the 'EMEP/UNECE Review Guidelines 2018' and use the EMEP/EEA Emission 'Inventory Guidebook' as a reference for methods and emission factors.

18. The ERT did not calculate any Technical Corrections and Romania did not provide any Revised Estimates.

[5] https://www.ceip.at/fileadmin/inhalte/ceip/3_review/advance_version_ece_eb.air_142_add.1.pdf

LIST OF MATERIALS PROVIDED TO ERT

1. Romania's Annex I reporting template
2. Romania's Stage 2 S&A report
3. Romania's Stage 1 report 2023
4. Romania's IIR 2023
5. Repdab-Report
6. Extended checks

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Responses to the question raised by ERT during the review
2. Material received from the Party during the Review
    - No additional information was provided by the Party either before or during the review.

ABBREVIATIONS

This list includes abbreviations commonly used in the Review Reports

AD	Activity data
BaP	Benzo[a]pyrene
BC	Black Carbon
C	Confidential
Cd	Cadmium
CEIP	Centre on Emission Inventories and Projections
CLRTAP	Convention on Long-range Transboundary Air Pollution – 'the Air Convention'
CO	Carbon Monoxide
E-PRTR	European Pollutant Release and Transfer Register
EEA	European Environment Agency
EF	Emission factor
EMEP	The co-operative programme for monitoring and evaluation of the long-range transmission of air pollutants in Europe (unofficially 'European Monitoring and Evaluation Programme' = EMEP)
ERC	Emission Reduction Commitment
ERT	Expert Review Team
GHG	Greenhouse gas
GIS	Geo Information System
GNFR	NFR Aggregation for Gridding and LPS
HCB	Hexachlorobenzene
Hg	Mercury
HM	Heavy metals
IEF	Implied emission factor
kt	Kilotonnes
LPS	Large Point Sources
NA	Not applicable
NE	Not Estimated
NECD	National Emission reduction Commitments Directive
NFR	Nomenclature for reporting
NH_3	Ammonia
NMVOC	Non-methane volatile organic compounds
NO	Not Occuring
NO_x	Nitrogen oxides
NR	Not relevant/Not Reported
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PCB	Polychlorinated biphenyls
PCDD/F	Polychlorinated dibenzo-p-dioxins and dibenzofurans
PM_{10}	Fine particulate matter: particles with an aerodynamic diameter equal to or less than 10 micrometres (μm)

$PM_{2.5}$	Fine particulate matter: particles with an aerodynamic diameter equal to or less than 2.5 micrometres (μm)
POPs	Persistent organic pollutants
PTC	Potential technical correction
RE	Revised estimate
SO_2	Sulphur dioxide
SO_x	Sulphur oxides
TC	Technical correction
TSP	Total suspended particulates

LIST OF REFERENCES AND SUPPORTING DOCUMENTS

1. Annex I emission reporting template. Available at https://www.ceip.at/reporting-instructions

2. ECE/EB.AIR/111/Add.1: Decision 2012/3: Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

https://unece.org/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1__ENG_DECISION_3.pdf

3. ECE/EB.AIR/113/Add.1: Decision 2012/12: Guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

https://unece.org/DAM/env/documents/2012/EB/Decision_2012_12.pdf

4. ECE/EB.AIR/125: 2014 Reporting Guidelines for Estimating and Reporting Emission Data under CLRTAP https://unece.org/fileadmin/DAM/env/documents/2013/air/eb/ece.eb.air.125_E_ODS.pdf

5. ECE/EB.AIR/127/Add.1: Decision 2014/1: Improving the guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them https://unece.org/DAM/env/documents/2014/AIR/EB/Decision_2014_1.pdf

6. ECE/EB.AIR/130: Technical Guidance for Parties Making Adjustment Applications and for the Expert Review of Adjustment Applications, 14 April 2015 https://unece.org/DAM/env/documents/2014/AIR/EB/ECE_EB_AIR_130_ENG.pdf

7. ECE/EB.AIR/142/Add.1: Decision 2018/1: Updated methods and procedures for the technical reviews of air pollutant emission inventories reported under the Convention
https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2019/decision_2018_1_advance_version_ece_eb.air_142_add.1.pdf

8. EMEP/EEA: EMEP/EEA air pollutant emission inventory guidebook 2016, EEA Report No. 21/2016 European Environment Agency, Copenhagen. Available at: http://www.eea.europa.eu/publications/emep-eea-guidebook-2016

9. EMEP/EEA: EMEP/EEA air pollutant emission inventory guidebook 2019, EEA Report No. 13/2019 European Environment Agency, Copenhagen. Available at: https://www.eea.europa.eu/publications/emep-eea-guidebook-2019

10. TFEIP (2022): “Inventory adjustments in the context of emission reduction commitments (ERC)” available at: https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2022/technical_guidance_for_erc_adjustments_issue1.1.pdf