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

**2023**

**Albania**

**FINAL REPORT**

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# 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'<sup>(1)</sup> – 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<sub>x</sub> emissions including gridded data. While the focus was set on NH<sub>3</sub>, NMVOC and NO<sub>x</sub> emissions, also all other pollutants covered by LRTAP Convention and its protocols (i.e. SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, NH<sub>3</sub>, plus PM<sub>10</sub> PM<sub>2.5</sub>, BC, priority HMs and POP<sub>S</sub>) 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 Albania'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)

Ms. Aleksandra NESTOROVSKA-KRSTESKA (North Macedonia)

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<sup>1</sup> 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](http://www.unece.org/fileadmin/DAM/env/documents/2002/eb/air/EB%20Decisions/Decision_2018_1.pdf)

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 ALBREKTSSEN (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 Albania, 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<sup>2</sup> was used as a base for the review.

8. The emission inventory of Albania was received on 15 February 2023 and thus by the deadline of 15 February. The Informative Inventory Report was not received.

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<sup>2</sup> 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 Albania in providing an inventory including a significant level of detail.

No IIR was provided by Albania so the ERT considers the agriculture part of the inventory submission to be of poor quality in terms of transparency and accuracy.

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

- provide a IIR
- provide a detailed description of applied methodologies, data sources, choice of emission factors and activity data for all categories in the IIR.
- ensure that the agriculture emission inventory is complete
- conduct of a key category analysis for all pollutants
- perform and present an uncertainty analysis and use it to as a tool to focus on planned improvements to the key categories.
- provide gridded data.
- provide transparent information on recalculations
- ensure that the time series are consistent
- ensure that activity data is included in the NFR tables
- increase the capacities of the air pollution inventory team in order to manage a transparent, complete, comparable, consistent and accurate inventory within deadlines set up in the UNECE reporting Guidelines.
- provide detailed information on its QA/QC plan for its air emission inventory in future submissions.

## **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<sub>3</sub>, NMVOC and NO<sub>x</sub> emissions, also all other pollutants covered by the LRTAP Convention and its protocols (i.e. SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, NH<sub>3</sub>, plus PM<sub>10</sub> PM<sub>2.5</sub>, BC, priority HMs and POP<sub>s</sub>) 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<sup>3</sup>**

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-1	PM		Yes		R	AC <sub>3</sub>
<p><b>Observation</b> The ERT noticed that national total emissions of PM<sub>2.5</sub> substantially exceeds TSP and PM<sub>10</sub> emissions for 2009-2021. Per definition PM<sub>2.5</sub> emissions are a subset of PM<sub>10</sub> emissions and it should be less or at least equal to PM<sub>10</sub>. During the review Albania did not provide reasons for the inconsistency to the ERT.</p> <p><b>Recommendation</b> The ERT recommends Albania to check consistency between PM<sub>2.5</sub> and PM<sub>10</sub> emissions in all sources, identify potential errors and correct the errors in the next submission.</p>						
ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-3-1	All pollutants	3	Yes		R	AC <sub>3</sub>
<p><b>Observation</b> The ERT noticed that emissions of all pollutants from all the categories as well as relevant activity data are the same in 2019-2021. During the review Albania did not provide reasons for data replication to the ERT nor information about the plans of recalculation of activity data and emissions.</p>						

<sup>3</sup> 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<sub>1</sub> (Completeness), C<sub>2</sub> (Comparability), C<sub>3</sub> (Consistency) for definitions of these criteria see EMEP/EEA Guidebook 2019

**Recommendation**

The ERT strongly recommends Albania to obtain activity data and recalculate emission estimates for 2019-2021 in the next submission.

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-3B-1	NH <sub>3</sub>	3B	Yes		R	AC <sub>3</sub>

**Observation**

The ERT noticed that NH<sub>3</sub> emissions from manure management of broilers (3B4gii) in 2018-2021 differs substantially from other countries and previous time series, as those are extraordinary high. During the review Albania underlined a mistake and provided a revised estimate for a single reporting year (2021) as a response. The ERT calculated a technical correction based on the available activity data (though it was same for 2019-2021) which was then agreed by Albania and here after accepted as a revised estimate.

**Recommendation**

The ERT recommends Albania to directly use the revised estimate for 2018 in the next submission, also to use revised estimate calculated for 2019-2021 by applying changes based on ERT Recommendation AL-2023-3-1 in the next submission. For more information on the issue see Annex I Technical Corrections and Revised Estimates.

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-3B-2	NMVOG, NH <sub>3</sub> , PM	3B	Yes	Tier 1	R	AC <sub>3</sub>

**Observation**

The ERT noticed that a number of categories under 3B constitute key categories for NMVOC, NH<sub>3</sub> and PM emissions. Namely key categories for NMVOC are 3B1a, 3B4gi, 3B4d, 3B1b, 3B2 and 3B4gii; For NH<sub>3</sub> - 3B4gii, 3B1a (and may be others too); for PM<sub>10</sub> - 3B4gi, 3B1a; for TSP - 3B4gi, 3B1a, 3B2, 3B4d. The ERT notes that using a Tier 1 method is not best practice, and could result in an over and/or underestimate of emissions. During the review Albania informed the ERT that they use Tier 1 emission factors to estimate emissions from these key categories due to lack of country specific information, hence the application of advanced methodology depends on availability of resources and activity data. Albania also presented partially filled Manure Management N-flow tool.

**Recommendation**

The ERT recommends Albania to use a Tier 2 or higher method for all key categories for which relevant activity data and parameters are available. For all other key sources the ERT recommends to explore possibilities to obtain the baseline data.

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-3B-3	NMVOC, NH <sub>3</sub> , PM, NO <sub>x</sub>	3B	Yes		R	TAC <sub>3</sub>

#### Observation

The ERT noticed major time series inconsistencies for several categories and pollutants: NH<sub>3</sub> from 3B2, 3B4d in 1994-95, 3B4e in 1992; NMVOC from 3B4d and 3B2 in 1994-95, PM10 and TSP from 3B4gi in 2011, all pollutants from 3B4a in 1994 and from 3B4giii in 2012. During the review Albania informed the ERT that relevant activity data is taken from FAO for Albania, however they could not get an explanation from data provider on the inconsistencies.

#### Recommendation

The ERT recommends Albania to obtain and include explanation of notable interannual variations of emissions in future IIRs.

ID	Pollutants	NFR category	Key Category	Tier level	Type	TAC <sub>1</sub> C <sub>2</sub> C <sub>3</sub>
AL-2023-3D-1	NMVOC, NH <sub>3</sub> , PM, NO	3D			R	AC <sub>3</sub>

#### Observation

The ERT noticed that despite availability of Tier 1 emission factors in EMEP/EEA guidebook emissions of NO<sub>x</sub> from 3Da, NMVOC emissions from 3De, NH<sub>3</sub> emissions from 3Da1, 3Da2b, 3Da2c and PM emissions from 3Dc are not estimated. During the review Albania informed the ERT that estimation of 3D depends on availability of resources and activity data which is missing in Albania at this stage.

#### Recommendation

The ERT recommends Albania to calculate emissions from all categories of 3D for which activity data are available in the country. As for all other sources under 3D, for which at least Tier 1 method for calculation exists in the EMEP/EEA Guidebook, the ERT recommends to explore possibilities to obtain the baseline data.



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

No gridded emission data was reported.

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

11. In the Appendix of the 'EMEP/UNECE Review Guidelines 2018'<sup>4</sup> 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 underestimate 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.

12. Albania sent one revised estimate that was accepted by ERT. The ERT recommends Albania to consider the Revised Estimates accepted by the ERT in their next inventory submission

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<sup>4</sup> [https://www.ceip.at/fileadmin/inhalte/ceip/3\\_review/advance\\_version\\_ece\\_eb.air\\_142\\_add.1.pdf](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. Albania Annex I reporting template
2. Albania Stage 2 S&A report
3. Albania Stage 1 report 2023
4. 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
  - Albania\_Manure Management N-flow tool

## ANNEX I TECHNICAL CORRECTIONS AND REVISED ESTIMATES

13. Albania sent one Revised Estimate that was accepted by the ERT. Detailed related information is provided separately in the Excel file:

- Albania\_TC1-2023-NFR.xlsx

**Table 2: Revised Estimates received from Albania and accepted by the ERT**

<b>Revised estimate for NH<sub>3</sub> emissions in 3B4gii Manure management - Broilers</b>			
Year	Original estimate (kt)	Revised Estimate received from MS (kt)	Difference between original estimate and Revised Estimate (kt)
2005	1.31	1.31	0.00
2018	34.18	0.3926	33.7861
2019	33.57	0.3856	33.1862
2020	33.57	0.3856	33.1862
2021	33.57	0.3856	33.1862

**Table 3: Effect of the Revised Estimates on the National Total**

Year	National Total (kt) <sup>5</sup>	Sum of Revised Estimates (kt)	National Total including Revised Estimates (kt)
2005	26.12	1.31	26.12
2018	53.98	0.39	20.19
2019	51.98	0.39	18.80
2020	51.98	0.39	18.80
2021	51.98	0.39	18.80

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<sup>5</sup> Line 141 in Annex I to the reporting guidelines (NFR table)

## 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 <sub>3</sub>	Ammonia
NMVOG	Non-methane volatile organic compounds
NO	Not Occuring
NO <sub>x</sub>	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 <sub>10</sub>	Fine particulate matter: particles with an aerodynamic diameter equal to or less than 10 micrometres (µm)

PM <sub>2.5</sub>	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 <sub>2</sub>	Sulphur dioxide
SO <sub>x</sub>	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\\_DE\\_CISION\\_3.pdf](https://unece.org/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1_ENG_DE_CISION_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](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](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](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](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)  
[https://www.ceip.at/fileadmin/inhalte/ceip/00\\_pdf\\_other/2019/decision\\_2018\\_1\\_advance\\_version\\_ece\\_eb.air\\_142\\_add.1.pdf](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](https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2022/technical_guidance_for_erc_adjustments_issue1.1.pdf)