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# Task Force on Reactive Nitrogen

Under the Working Group on Strategies and  
Review of the UNECE Convention on Long-range  
Transboundary Air Pollution

**EB decision 2007, revised EB decision 2018/6**

Co-chairs:

Tommy Dalgaard, Cláudia SC Marques dos Santos, Mark Sutton

Lead country: Denmark

WGSR 61, Geneva 4-6 September 2023

<https://unece.org/info/Environmental-Policy/Air-Pollution/events/371555>

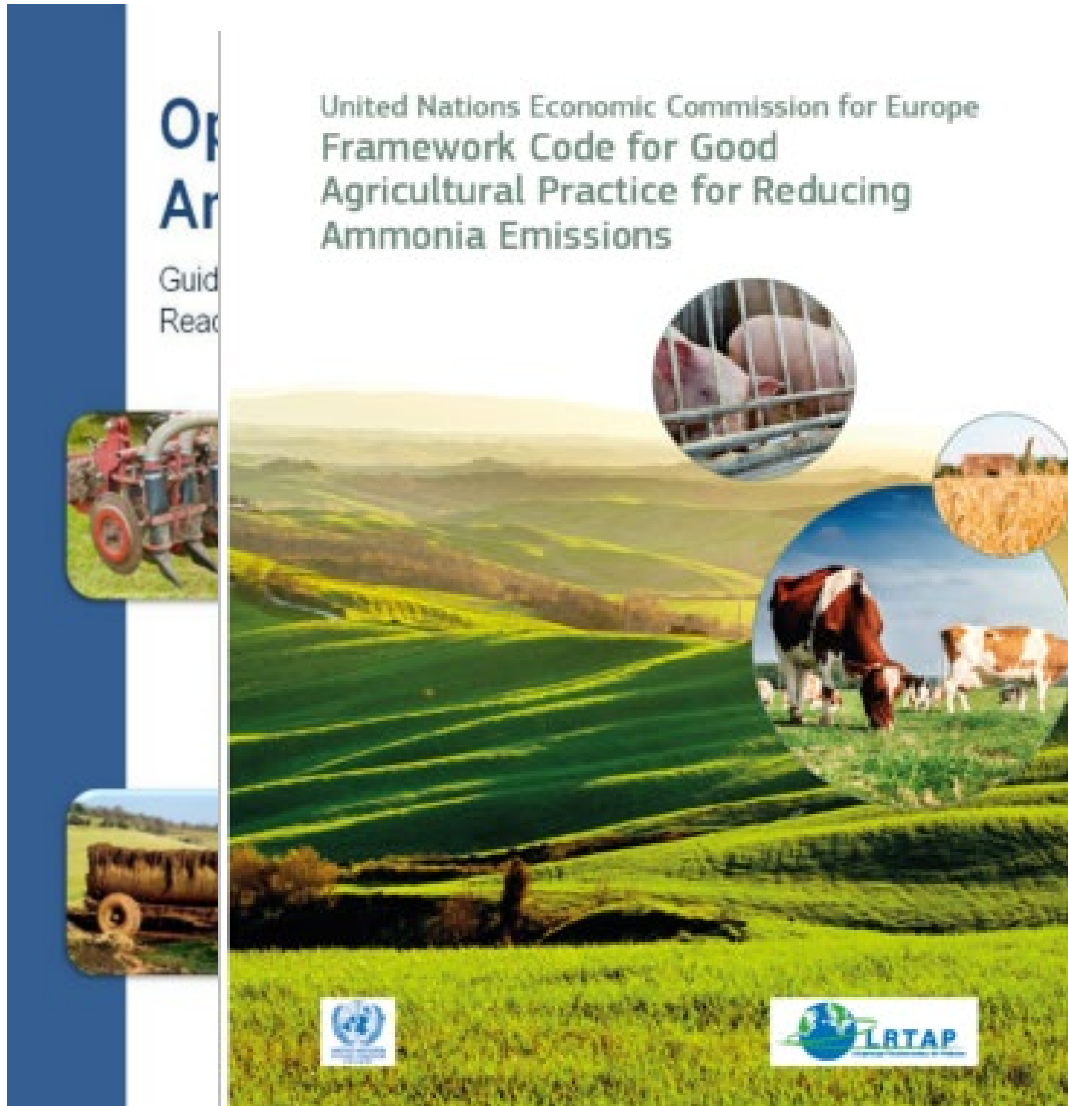
# TFRN Status

[https://unece.org/sites/default/files/2023-](https://unece.org/sites/default/files/2023-07/Agenda%20item%20%282%29%20Report%20of%20the%20Task%20Force%20on%20Techno-economic%20Issues.pdf)

[07/Agenda%20item%20%282%29%20Report%20of%20the%20Task%20Force%20on%20Techno-economic%20Issues.pdf](https://unece.org/sites/default/files/2023-07/Agenda%20item%20%282%29%20Report%20of%20the%20Task%20Force%20on%20Techno-economic%20Issues.pdf)

- **General status**
  - TFRN-16 meeting online Nov '22 (61 experts from 21 countries)
  - TFRN-17 meeting, Dessau and hybrid, May '23 (86 experts from 22 countries, incl. from TFTEI etc.)
- **The four TFRN expert panels**
  - EPMAN - Expert Panel on **Mitigating Agricultural Nitrogen**
  - EPNB - Expert Panel on Nitrogen **Budgets**
  - EPNF - Expert Panel on Nitrogen and **Food**
  - EPN-EECCA - Expert Panel on Nitrogen in **EECCA countries**
- **Further TFRN activities and contributions, incl. collaboration with TFTEI and other bodies**

# EPMAN – revised ammonia guidance



Initial prep.  
meeting April 2023

Start revision  
process at meeting  
in Aarhus,  
November 2023

(proposed 2 yr  
process for  
discussion)

Alberto Sanz-  
Cobena  
on board

Inf. Doc. for the 61<sup>st</sup> Session of the Working Group on Strategies and Review of the UNECE Convention on Long-range Transboundary Air Pollution (September 2023).

## **Planned Revision of the UNECE Ammonia Guidance Document: Questions and possible outline of contents of the revised document**

Submitted by the Co-chairs of the Task Force on Reactive Nitrogen

3. Given that this is a substantial document, we note that it is longer than normal UNECE word limits (10,000 words). Therefore, we invite Parties to guide on possible approaches to address this, e.g.:
  - i. **Option 1:** Allow a full revision as this is an existing document that exceeds the usual word-limits. The document would be prepared in two forms: a) an informal document for official adoption<sup>3</sup>, and b) a published version of the document for dissemination, including authorship attributions and pictures.
  - ii. **Option 2:** Prepare three versions of the text: a) a document that specifies the revisions made (target within 10,000 words, to be reviewed), b) a consolidated version that would combine the revisions and existing text for publication, c) a published version for dissemination of the consolidated version, with authorship attribution and pictures.
  - iii. **Option 3:** A fully restructured document that is c.  $\frac{1}{4}$  of the length of the the existing Ammonia Guidance Document.

# Proposed table of contents

**Preface**

**Executive Summary**

**Chapter 1:** Introduction

**Chapter 2:** Nitrogen management, considering of the whole nitrogen cycle & N/C interactions (inc. mention to different system boundaries)

**Chapter 3:** Livestock feeding strategies (note: direct link with the CH<sub>4</sub>-NH<sub>3</sub> GD, see annex below). NOTE: nutrition experts needed here.

**Chapter 4:** Livestock housing (note: Synergies with animal welfare in a context of EU increasing targets on welfare. This is link to new technologies in terms of housings)

**Chapter 5:** Manure management systems & processing (inc. AD, composting, separation...)

**Sub-chapter 5.1.** Anaerobic digestion & potential for recovery

**Sub-chapter 5.2.** Manure storage techniques & use of additives

**Chapter 6:** Manure application techniques

**Chapter 7:** Synthetic fertilizer application (inc. slow-release fertilizers & inhibitors)

**Chapter 8:** Non-agricultural stationary and mobile sources: production of fertilizers...

**Annex A:** 'The special case of emission from organic livestock and crop farms'

**Annex B:** Methods for measurements & Quality Criteria (very important for e.g. additives to manures) of publications (trustable sources of information).

**Annex C:** Ammonia and interactions with (all) GHG (with a focus on methane)

# National ammonia codes

- Number of parties to the GP – 37 ratified the original 1999 protocol, and 26 ratified the 2012 amended protocol,
- In 2020 TFRN reported 18 published incl. those imbedded in other codes – has it developed?
- Results from Survey from Claudia to report on

# EPNB – Nitrogen Budgets

- Co-chairs Wilfried Winiwarter IIASA-AUS, and Markus Geupel, UBA-DE
- Report from 3 May 2023 meeting available from <https://www.clrtap-tfrn.org/epnb>
- Guidance document (UN-ECE) as a framework exists (see [www.clrtap-tfrn.org](http://www.clrtap-tfrn.org)) incl. detailed instructions (annexes)
- Update to current guidance document on National N budgets foreseen for end 2024 (according to workplan)
- Successful application to Germany and other countries have identified potentials
- New national N budget visualization tool has been developed, to be hosted at the INMS website as a budget repository
- Further country support is essential to proceed further (workplan point 2.4.5 workshop and publication).

# EPNF – nitrogen and food

- Co-chairs Adrian Leip, EC-JRC, and Susanna Kugelberg, UN-WHO, Copenhagen, + Joao Leite
- **Food system approach** (from a nitrogen perspective) with focus on:
  - Food chain losses/waste and opportunities for improvement
  - Food production technological efficiencies and mitigation options
  - Consumption (health) issues and way forward
- Achieving 50% N pollution reduction extremely difficult without dietary change; more plant based diets are key
- Special issue completed (*Managing Nutrients: The key to achieve sustainable food systems for healthy diets. Leip, Kugelberg and Bodirsky, eds.*)
- New **Appetite for change** report expected end 2023
- Option for thematic session at next WGSR, June 2024



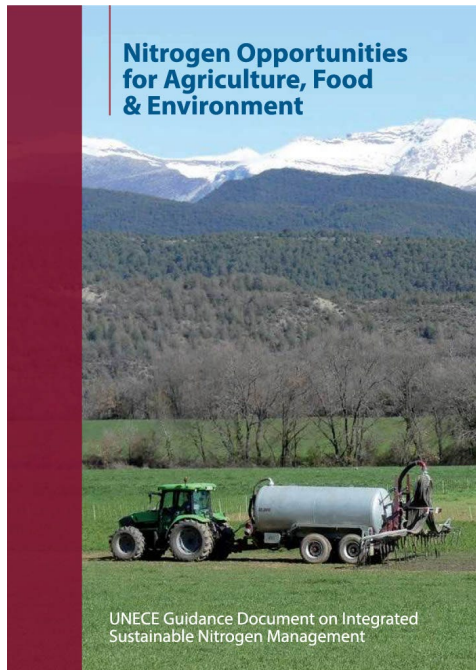
# EPN-EECCA at a second stage

- Linking Convention activities with other conventions at global-scale
- INMS partnership with GEF and UNEP
- Presentation at the “Halving N Waste by 2030” XXI Int. N workshop in Madrid, Oct. 2022
- Special link of this Expert panel to the East-Europe demonstration region funded by INMS

# Integrated N guidance document

[https://unece.org/sites/default/files/2021-04/Advance%20version ECE EB.AIR 149.pdf](https://unece.org/sites/default/files/2021-04/Advance%20version_ECE_EB.AIR_149.pdf)

Working Group on Strategies and x | ECE\_EB.AIR\_WG.5\_2022\_2-220105 x | Nitrogen Opportunities for Agric x +  
clrtap-tfrn.org/content/nitrogen-opportunities-agriculture-food-environment-unece-guidance-document-integrated-0



## Nitrogen Opportunities for Agriculture, Food & Environment: UNECE Guidance Document on Integrated Sustainable Nitrogen Management

Submitted by Natalie on Mon, 21/11/2022 - 12:26

Publication Type:

Report

Authors:

[Mark Sutton](#); [Clare M. Howard](#); [Kate E. Mason](#); [Will Brownlie](#); [Claudia Cordovil](#)

Source:

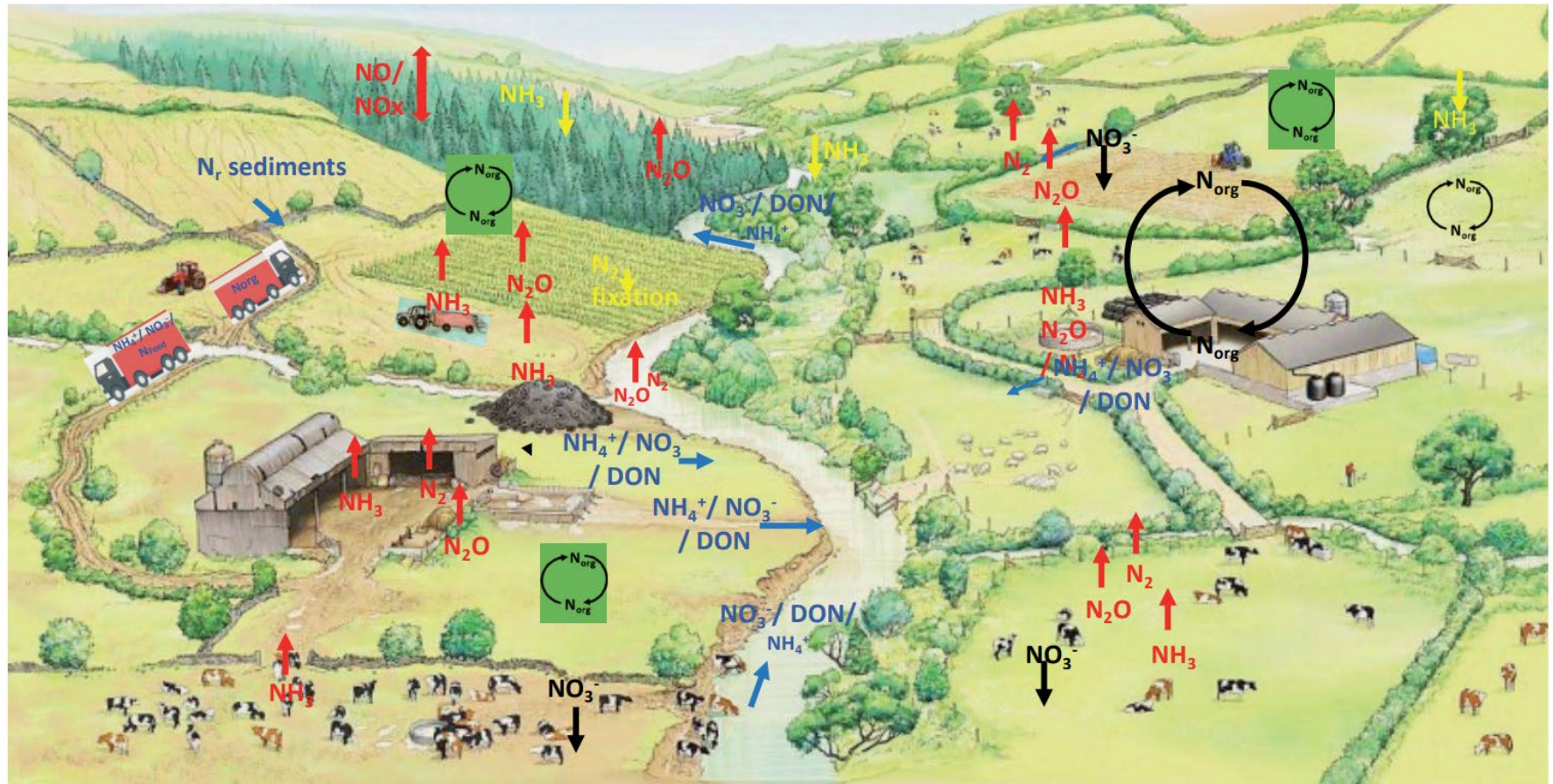
(2022)

ISBN:

978-1-906698-78-2



**Figure VI.1:** Simplified overview of landscape N<sub>r</sub> flows showing source and sink functions of landscape elements such as farm buildings, fields, forests, pasture etc. for various N<sub>r</sub> forms



## **Working Group on Strategies and Review**

**Sixty-first session**

Geneva, 4–6 September 2023

Item 2 of the provisional agenda

**Progress in the implementation of the 2022–2023 workplan**

### **Co-mitigation of methane and ammonia emissions from agricultural sources: policy brief and guidance**

#### *Summary*

The present document was prepared by the Task Force on Reactive Nitrogen in cooperation with the Task Force on Techno-economic Issues in accordance with item 2.2.1 of the 2022–2023 workplan for the implementation of the Convention. It provides information on possible interactions between ammonia and methane mitigation measures and on considerations to be taken into account for simultaneous mitigation, as well as serving as a background document for future policy development.

The Working Group on Strategies and Review is invited to discuss the document and to forward its final version to the Executive Body for adoption at its forty-third session (Geneva, 11–14 December 2023).

<https://unece.org/environment/documents/2023/06/working-documents/co-mitigation-methane-and-ammonia-emissions>

## Contents

Executive Summary.....	
A. Background.....	
B. Methane as an air pollutant and a greenhouse gas.....	
C. Interactions between ammonia and methane emission mitigation.....	
D. Conclusions .....	
E. Principles and important considerations for simultaneous mitigation of methane and ammonia emissions .....	

Table 1. Anthropogenic sources for emissions of methane and ammonia in the EU/UN-ECE.

<b>Source of emission</b>	<b>Methane</b>	<b>Ammonia</b>
Agriculture	55.9%	93%
- Livestock and livestock manure	45.3%	74.1%
- Other	9.5%	18.9%
Waste (household, sewage, garden)	1.1%	
Energy industry and other sectors	23.6%	1%
	20.4%	6%

## **IV. Principles and important considerations for simultaneous mitigation of methane and ammonia emissions**

11. The combined effects of  $\text{NH}_3$  and  $\text{CH}_4$  mitigation measures are important to consider, especially in relation to measures targeted at the livestock sector. While there are obvious win-wins between  $\text{NH}_3$  and  $\text{CH}_4$  mitigation, there are also trade-offs that need to be addressed. In any evaluation, the whole agricultural production system needs to be considered in an integrated approach.

12. Based on the listed  $\text{NH}_3$  and  $\text{CH}_4$  air pollution interactions discussed above, and the general principles of the Guidance document on integrated sustainable nitrogen management (ECE/EB.AIR/149), the following guiding principles on the opportunity to exploit synergies with extensive environmental benefits and develop approaches that minimize the trade-offs between the control of these two gases can be derived as below.

- A. Livestock
  - B. Manure storage
  - C. Anaerobic digestion
  - D. Aeration of slurry
  - E. Pastures
  - F. Integrated nutrient management
- (In total 34 principles)

# Progress in the implementation of the 2022-2023 workplan

<https://unece.org/environment/documents/2023/07/informal-documents/agenda-item-2-report-task-force-reactive-nitrogen>

- 2.1.2 Review of the sufficiency and effectiveness of the Gothenburg Protocol as amended (input provided to support the review)
- 2.2.1 Analysis of the interactions between emissions of CH<sub>4</sub> and NH<sub>3</sub> and other N-compounds, and the potential for co-mitigation from agric. sources (with TFTEI etc.)
- 2.2.2 Promotion of guidance document on integrated sustainable N management
- 2.2.3 Development of a guidance document on non-technical and structural measures (lead by TFIAM)
- 2.2.4 Promotion of guidance documents, including those recently adopted (top 5 -> top 10 measures, INMS Global N Assessment etc., NAC implementation follow ups)
- 2.2.5 Launch preparations of new guidance documents in revision of existing documents (i.e. the Ammonia Guidance document)