



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 S. C. Marques-dos-Santos, Mark Sutton Lead country: Denmark

TFTEI 8th October 2025

TFRN Status

https://unece.org/sites/default/files/2025-04/Agenda%20item%202%20TFRN_report2025_0410.pdf

General status

- UNECE Ammonia Guidance Document revision workshop 18-19 June 2024 in Aarhus, Denmark / hybrid format together with TFRN-18 (90 experts from 23 countries, ≈50 in person), kindly sponsored by DK.
- TFRN-19 meeting, 24 April 2025 via Teams (>50 registered from 20 countries, https://www.clrtap-tfrn.org/TFRN-19), TFRN-20 planned for DK October 2025.

The four TFRN expert panels

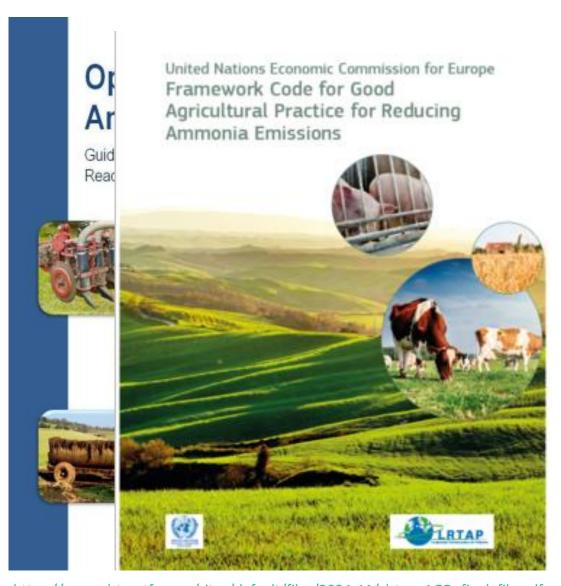
- EPMAN Expert Panel on Mitigating Agricultural Nitrogen
 - Ammonia Guidance Document update process
- EPNB Expert Panel on Nitrogen Budgets
- EPNF Expert Panel on Nitrogen and Food
- EPN-EECCA Expert Panel on Nitrogen in EECCA countries
- Further TFRN activities and contributions, incl. collaboration with TFTEI and other bodies



TFRN-20 UNECE Task for on Reactive Nitrogen meeting – Helsingør Denmark, October 23-24th

- **Session 1:** Strategic Overview of TFRN tasks, in particular in relation to revision of the Gothenburg Protocol.
- **Session 2:** Updating guidance on ammonia mitigation and information on costs and benefits.
- **Session 3:** National case studies. Evidence from Parties on ammonia and nitrogen mitigation strategies.
- Session 4: National Nitrogen Budgets. How they can help, call for evidence and state of progress.
- Session 5: Nitrogen, Food and Food waste. How to develop opportunities for non-technical approaches to reduce nitrogen pollution with multiple co-benefits.
- Session 6: Agreement on next steps.

EPMAN – ammonia guidance revision

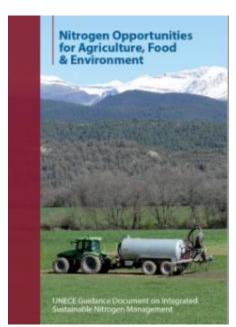


Alberto Sanz-Cobena (UPM Spain) and Rasmus Einarsson (SLU Sweden) on board Together with the EPMAN expert panel chairs Shabtai Bittman (AGR, Ca) and Barbara Ammon (ATB, DE)

- Revision process started at meeting in Aarhus, Nov 2023
- Next summary meeting October 2025 in DK

UNECE Guidance Document on Integrated Sustainable Nitrogen Management

- 24 principles; 76 measures
- Adopted by UN Air Convention



ECE/EB.AIR/149



Dietary Measure 5: Adapt protein intake in diet (poultry)



Housing Measure 1: Immediate segregation of urine and faeces (cattle)



Manure Measure 2: Covered storage of slurry (natural crust & impermeable base)



Nutrient Recovery Measure 5: Ammonia stripping and recovery



Field Measure 14: Nitrification inhibitors (with inorganic fertilizers)



Landscape measure 8: Drainage management





National Ammonia Codes (NACs)

- 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
- How has it developed? Possible update of survey to be send out via the secretariate



EPNB – Nitrogen Budgets

Co-chairs Wilfried Winiwarter IIASA-AUS, and Markus Geupel, UBA-DE

- Guidance document (UN-ECE) as a framework exists (see <u>www.clrtap-tfrn.org</u>) incl. detailed instructions (annexes)
- A **revised Guidance Document** has been submitted to UNECE as a formal document to WGSR, in English with **translation into Russian and French**. The document has been endorsed by TFRN.
- The **Annexes to this guidance document** have been fully revised for completen ess and consistency. This was contracted work, enabled by an in-kind contribution by Germany. The revised Annexes also have been endorsed by TFRN and are available as final draft (subject to final copy-editing) at https://www.clrtap-tfrn.org/epnb .
- A **summary for policymakers** has been prepared based on that revised guidanc e and is available as an informal document to WGSR.
- A policy brief on NNationalBudgets and the updated guidance has been put int
 o the Work Plan for September, subject to funding.

Conclusions

- Guidance to National Nitrogen Budgets is complete
 - **Documents**
 - Templates
 - Procedures
- Endorsement by EPNB and TFRN
- Scientific underpinning is available
- Material completed to support national experts to establish NNBs
- EPNB is looking forward to country activities
- policy document is available 4-page summary of NNB purpose and update





National Nitrogen Budgets

Summary for policy makers

Reactive pitrogen (Antis a highly mobile and conventible form of an element that plays and indispensable role in nature and in many human processes. As a plant nutrient and to maintain sall tertility, nitrogen is an essential component of productive agricultural systems. At the sene time, anthropogenic emissions of Nr lead to a variety of ecvironmental problems. The recase of Nº Into the environment occurs in almost every area of human activity, e.g. air and water pollution through spricultural activities, transport, inclustry or power generation. Once set free into the earth's biogeochemical cycle, in trogen is highly mobile and can possitionough various forms and environmental moda. In succession and have various undestrable entronmental effects (which in its secuence is called the nitrogen cascade). In order to minimes the harmful effects of Nr on Furnans and the environment, it is of great importance to succumental policy to know as precisely as possible. Instituantities of teats fee introgent that order the environment in various forms and harm humans and the environment. It is also helpful to quantify exchange processes by which Notis converted from one form to snother or abilited from one environmental domain or sector of the economy to another.

Nitrogen budgets are a proven policy tool for quantifying the sources and fate of nitrogen. he Conversion on long range Transboundary Air Politican (CLRTAP) in 2012 addocted a The Companies on congress transcervery or process and participation of material planners to assist in the concustors of national planners budgets IAMB) transfer under the property of the property and at technical anneces, has been thoroughly updated for AUX/LIAMOVED). This purposes, and as recorded version is ready for adoption in 2025, with ACCORDING TO SECURE AN ARM MADDING, THE LEWISCO AND ARM IS ARROWS THE ARMOUNT OF ARMOUNT the complete arrange and care remarks assumed to whole N discusse of a country including ment of circum mature constraints and many and another properties of control products with information Investigation of sections and the property and dependent of the property of the section of the s for certifing intergencian points and coverous generative in patent reduction mediate is, seek for compatible is a contact the induction of implementacy politics and they are useful for compatible in contact the induction of implementacy politics. able control the Probe of Implemented Edition and they are learned to be assumed to be stops technical test but not least they can help proport, knowledge purposes that term to the to propose and the control uncontained of the mixture and the Control and Control and the Mixture and the Control and the Mixture and the Control and the Mixture and the Mixtur fig the scenting uncertainting of the nutrician cascade. Specifically, they subspice the state of the following Product of the Chitap (Market 2, 3, d) and of the state of the case of the state of the the implementation of the foot-serborg Protocol or the CHI INV for the C. S. G.J. and G.I. It's placed at the foot-serborg protocol or the CHI INV for the Language Months (Anne. 3). Motional Limitation reduction Commitments (MEC) Directive of the European Union Dannes of part Liang possible Axis for observing the attractive and neutrinos reductives for gods as see by the Action of Section 1 and part) are provide a tox for observing the efficient of treatment reduction that gets as set by part) tree provides tox described and very by the content of the Convergence on the Convergence of the Convergence on the Convergence of the Conve

Standardized instruments for easy apputation

To inspecial amounts for Easy apputation

Strong For the decidance for the California of Darranger of Const. The in-default the Proc. Institution of the development of a No. Pittreem by select the analysis the openhance of the Analysis of t

To be trivial anomals to the cuidance Darkment cover-the in detail the machine background of the development of a Nov. Nitrogen budgets explain the exchange of submittees or part monts, the cooperative and the such and of submittees are submittees and the submittees of submittees are submittees and the submittees of submittees are submittees and submittees are submittees and submittees are submittees are submittees and submittees are submittees and submittees are submittees are submittees and submittees are submittees and submittees are submittees are submittees and submittees are submittees and submittees are submittees and submittees are sub approach for the development of a N.D. Nitrogen because explain the exchange of quantities of a substance of a





EPNF – Nitrogen and Food

- Co-chairs Adrian Leip, EC-JRC, and Susanna Kugelberg, UN-WHO,
 Copenhagen (+ Joao Leite and Jan Wollgast)
- 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
- The **Appetite for change**: food options for nitrogen, environment and health **Report published** https://www.clrtap-tfrn.org/content/appetite-change-food-system-options-nitrogen-environment-health-2nd-european-nitrogen)
- Perspectives presented at the Leuwen-meeting
 - It shows how behavioural change options such as change towards more plant-based foods can be combined with technical measures across the chain to halve nitrogen waste
 - See also the Draft guidance document on non-technical measures



EPN-EECCA at a second stage

- Linking Convention activities with other conventions at global-scale
- INMS partnership with GEF and UNEP
- Presentations at the XXII Int. N workshop in Aarhus, June 2024
- Special link of this Expert panel to the East-Europe demonstration region funded by INMS
- Task 4.4.2 Expert consultancy on Preparing and facilitating a workshop and farm site visit on good agricultural practice in Georgia and other interested country

Additional activities Ammonia (NH₃) as energy carrier

- 2024-2025 work plan item 2.1.7. Inf. doc. submitted by TFRN, as reported by Rasmus Einarsson, SE (proceeding work with TFTEI and others).
- NH₃ is a carbon-free energy carrier.
 Considerable industry interest for use as liquid fuel in shipping, stationary combustion, etc.
- Large-scale adoption could increase global NH₃ use by factor 10.
- Substantial risk of increased nitrogen air pollution
 - Emissions of NH₃, nitrogen oxides (NOx), nitrous oxide (N₂O)
- Substantial risk of low or negative climate benefit
 - Use-phase emissions of N₂O
 - Current NH₃ production is entirely dependent on fossil energy
- Policy response urgently needed to ensure life-cycle net benefit



Revision and publication of Guidance document on national nitrogen budgets and supporting documents Options for Ammonia Mitigation

Splash Plate Spreader
- 1950s technology

Slurry spreading: a wide range of low-emission techniques are available

Trailing Hose

Requirements now in: NL, DK, BE, IE, CH, DE, parts of UK (Scot, NI)...

ECE/EB.AIR/129



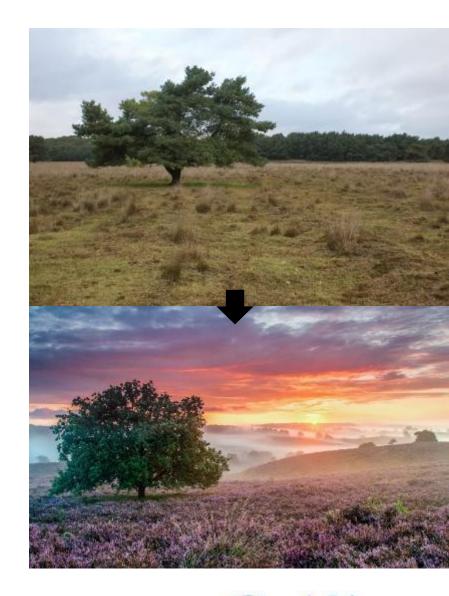






Benefits

- Reduced effects on human health, natural environment, materials and crops
- Improved protection of biodiversity
- Reduced cost of nature protection and nature restoration
- Billions of € cost savings from reducing waste of valuable resources
- Improved food security, through reduced dependence on new N_r inputs.





THANK YOU