

Minutes of the UN ECE TFRN-19 meeting

Time: 24 April 2025, 14:00-15:30 CEST/13:00-14:30 BST

Venue: Online via MS Teams (hosted by Aarhus University, Denmark)

Attendees: 58 representatives from more than 20 nationalities

Official Agenda

(available via <https://www.clrtap-tfrn.org/TFRN-19>)

1. Welcome by the TFRN Co-chairs.
2. Revision of the Guidance document on National Nitrogen Budgets.
 - Presentation from the Expert Panel on Nitrogen Budgets (EPNB) / by Wilfried Winiwarter and Markus Geupel (see documents at: https://unece.org/sites/default/files/2025-03/Advance%20version_ECE_EB.AIR_WG.5_2025_3.pdf , and <https://unece.org/info/Environmental-Policy/Air-Pollution/events/393909>)
 - Discussion
3. TFRN contributions in the context of the revision of the Gothenburg Protocol, and elements proposed by TFRN for the 2026-27 workplan.
 - Presentation by Till Spranger on the GP revision process, with possibility for clarifying questions
 - Proposed TFRN work plan items 2026/27 presented by Mark Sutton / The TFRN co-chairs (see draft workplan available at https://unece.org/sites/default/files/2025-03/ECE_EB.AIR_WG.5_2025_1%20Draft%20work-plan_ADVANCE.pdf)
 - Discussion
4. Forthcoming meetings to which TFRN contributes.
 - WGSR-63 meeting in Geneva, 26-28 May 2025 (see provisional agenda at https://unece.org/sites/default/files/2025-03/ECE_EB.AIR_WG.5_133.pdf)
 - Workshop in Brussels on the revision of the Ammonia Guidance document, 23-25 June 2025. Short status from the expert panel chairs (Shabtai Bittman, Barbara Amon, Rasmus Einarsson and Alberto Sanz Cobeña).
 - October workshop / TFRN-20 hybrid meeting, planned back to back to heads of delegation meeting, week 43 (20-24th October), North Zealand, Denmark
5. AOB
 - Comments for the TFRN annual report for the in person reporting for the WGSR-63 meeting in Geneva 26-28 May 2025 (see <https://unece.org/info/Environmental-Policy/Air-Pollution/events/393909> ; click on informal documents)
 - Comments for the draft Workplan 2026-2027 document to be discussed at the WGSR-63 meeting in Geneva 26-28 May 2025 (see <https://unece.org/environment/documents/2025/03/working-documents/draft-2026-2027-work-plan-implementation-convention>)
 - Other points?

Minutes

1. Welcome

Tommy Dalgaard welcomed all participants on behalf of the TFRN Co-chairs, Mark Sutton and Claudia Marques Dos Santos. Attendees were briefed on the meeting agenda and invited to suggest additional points. It was confirmed that the meeting was being recorded and transcribed for minute-taking. Kasper Bo Sørensen was introduced as responsible for drafting the minutes.

2. Revision of the Guidance Document on National Nitrogen Budgets

Wilfried Winiwarter og Markus Geupel from the Expert Panel on Nitrogen Budgets (EPNB) presented the revised guidance document. Updates included changes in terminology, a revised appendix, a new appendix on the processing of residual products, and an Excel template for national reporting. A policy summary was also prepared, along with a proposal for a forthcoming data call.

3. TFRN's contribution to the revision of the Göteborg protocol and work plan 2026-2027.

Till Spranger reviewed the eight key negotiation items related to the revision of the Göteborg protocol. Particular attention was given to Annex IX and the role of ammonia. TFRN's contribution includes both technical and political input – especially in relation to the national nitrogen budgets and non-technical migration measures. It was discussed how TFRN could position itself strategically within the revision process. A well-defined work plan for 2026-2027 is considered essential to strengthen the Nitrogen effort within the UNECE framework.

4. Upcoming meetings

The following key meetings and events were announced: WGSR-63 meeting in Genève, 26–28. May 2025, where the nitrogen budget guidance is expected to be formally approved; the workshop in Brussels 23-25 June focusing on the revision of the ammonia guidance document with broad stakeholder participation; and the TFRN-20 hybrid meeting scheduled for week 43 in Denmark (around 20-24 October 2025), which is expected to follow directly after the Heads of Delegation meeting. Participation is encouraged both academically and strategically.

5. AOB

A short discussion was held on the voluntary nature of the data call and how to best implement it. Additionally, a new EU project focused on satellite-based ammonia measurements was mentioned. Participation also noted the importance of a better implementation of climate policies and air quality. The meeting concluded with thanks to the participants and an invitation to attend the upcoming workshops and meetings.

Appendix A, with slides presented:

Revision of the Guidance document on National Nitrogen Budgets

Wilfried Winiwarter, Markus Geupel, co-chairs
Expert Panel on Nitrogen Budgets

TFRN-19 (virtual), April 26, 2025
Based on outcomes of EPNB-22 in Dessau



Outline

- Coverage of National Nitrogen Budgets in legislation
- NNB related activities in the current work plan
- Changes in the Guidance Document
- Changes in the Annexes to the Guidance Document
- Further documents and Call for data
- Activities to scientifically back up methodology

Nitrogen Budgets in the current Gothenburg Protocol

Article 7

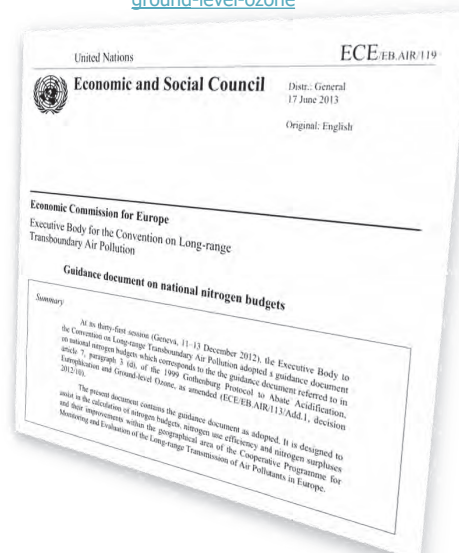
3. Upon the request of and in accordance with the timescales decided by the Executive Body, EMEP and other subsidiary bodies shall provide the Executive Body with relevant information on:

d) The calculation of nitrogen budgets, nitrogen use efficiency and nitrogen surpluses and their improvements within the geographical area of EMEP, using guidance adopted by the Executive Body.

<https://unece.org/environment-policy/air/protocol-abate-acidification-eutrophication-and-ground-level-ozone>

GUIDANCE DOCUMENT ON NATIONAL NITROGEN BUDGETS

https://unece.org/DAM/env/documents/2013/air/eb/ECE_EB_AIR_119_ENG.pdf

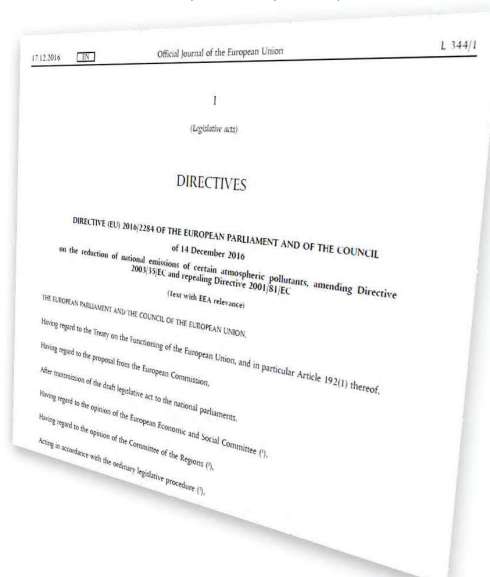


Nitrogen Budgets in the EU NEC Directive

• Annex 3 part 2

- **to support Article 6 on National Air Pollution Control programmes (optional reporting)**
- 2. Member States may establish a national nitrogen budget to monitor the changes in overall losses of reactive nitrogen from agriculture, including ammonia, nitrous oxide, ammonium, nitrates and nitrites, based on the principles set out in the UNECE Guidance Document on Nitrogen Budgets

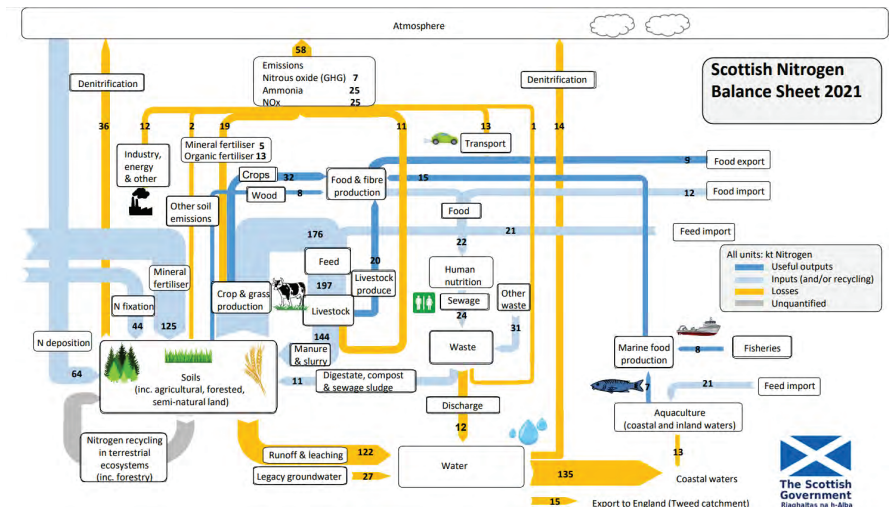
<https://www.eea.europa.eu/en/topics/in-depth/air-pollution/necd>



Scottish Statutory Instruments 2022 No. 87

- The purpose of the instrument is to establish, in law, a Scottish Nitrogen Balance
- Sheet. The Balance Sheet brings together evidence, from a range of sources, in
- relation to flows of nitrogen across Scotland's economy and environment.
- The act requires the Scottish Ministers to establish a nitrogen balance sheet, with the core purpose to record how "nitrogen use efficiency" contributes to achieving Scotland's national greenhouse
- gas emissions reduction targets.

<https://www.legislation.gov.uk/ssi/2022/87>



EPNB Commitments (work plan)

2.2.5	Revision and publication of Guidance document on national nitrogen budgets and supporting documents	(a) Revised Guidance document on national nitrogen budgets submitted for consideration to WGSR and Executive Body in 2025	(a) February 2025 (Markus Geupel) In-kind contributions by Germany
		(b) Extended summary for policymakers based on revised Guidance document	(b) February 2025 (Wilfried Winiwarter and Markus Geupel) In-kind contributions by Germany
		(c) Policy brief based on revised Guidance document and extended summary for policymakers to engage with parallel activities	(c) September 2025 (Wilfried Winiwarter and Markus Geupel) Subject to funding
		(d) Call for data to Parties in 2025, encouraging them to make use of reporting template on national nitrogen budgets with analysis of results in 2025–2026	(d) Launch at February 2025 (Markus Geupel and Wilfried Winiwarter); analysis subsequently Subject to funding

Guidance document

Overall aim: optimize consistency and clarity

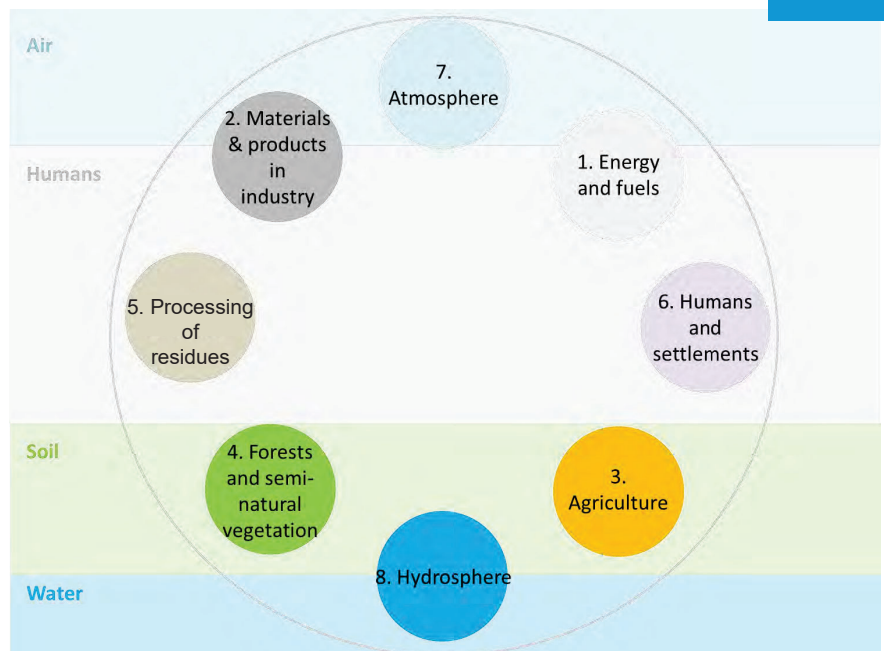
- Changes in “annexes” need to be reflected (see below) –concerning the structure of sub-pools
- Nomenclature adjusted to INA (N_r; “Processing of residues” for “Waste”)
- Endorsed by EPNB & TF chairs, shared with TFRN
- Submitted to WGSR as an official document (final editing & translation to French, Russian by the UNECE secretariat)
- To be formally approved by TFRN (with suggested changes if needed) for feeding into the WGSR process

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National Nitrogen Budgets

Essential pools and sub-pools to be included in a national nitrogen budget

Pool – Sub-pool name	Chap. No., technical annex	Code
Energy and fuels – Energy conversion	1, annex 1	EF.EC
Energy and fuels – Transport		EF.TR
Energy and fuels – Other energy and fuels		EF.OE
Energy and fuels – Manufacturing industries and construction		EF.IC
Materials and products in industry – Food and feed processing	2, annex 2	MP.FP
Materials and products in industry – Other producing industry		MP.OP
Agriculture – Manure management, storage and animal husbandry	3, annex 3	AG.MM
Agriculture – Soil management		AG.SM
Agriculture – Biofuel production and composting		AG.BC
Forests and semi-natural vegetation – Forests	4, annex 4	FS.FO
Forests and semi-natural vegetation – Wetland		FS.WL
Forests and semi-natural vegetation – Other land		FS.OL
Processing of residues – Solid waste	5, annex 5	PR.SO
Processing of residues – Wastewater		PR.WW
Humans and settlements (no sub-pool)	6, annex 6	HS
Atmosphere (no sub-pool)	7, annex 7	AT
Hydrosphere – Groundwater	8, annex 8	HY.GW
Hydrosphere – Surface water		HY.SW
Hydrosphere – Coastal water		HY.CW
Hydrosphere – Aquaculture		HY.AC



GD Annexes

Work contracted by German Environment Agency to INFRAS AG
(Bettina Schächli et al.)

- Completion of detailed working description based on past user experience
- Finalizing annex "Processing of residues"
- Harmonizing expressions, definitions, flows covered, ...
- Reporting template (.xlsx) allowing data export to STAN software
- Approved by EPNB
- Available as final draft at <https://www.clrtap-tfrn.org/epnb>
- Subject to final editing

NNB policy summary

- Available in final (and consistent) form, 4-page summary of NNB purpose and update
- Addresses policy makers
- References to GD and its annexes are included
- Subject to final editing
- For submission to WGSF as an informal document

Call for data – suggested procedure

- 1) WGSR at its 63rd session recommends to EB issuing a call for data for Parties to the Gothenburg Protocol in line with its article 7(3d);
- 2) EB at its 45th session:
 - Requests the secretariat to issue/circulate a call for data;
 - Requests TFRN to collect and CEIP to host the reported data in cooperation with the International Nitrogen Management System;
 - Requests Parties to the Gothenburg Protocol to submit data in line with its article 7(3d) to CEIP by 30 June 2027;
 - Requests TFRN to carry out the informative analysis of the submitted data and report back to WGSR in 2028;
 - Requests Parties to the Gothenburg Protocol to submit interim reports by 30 June 2026 to TFRN containing information on the planned activities.

Policy Brief

- Policy brief based on revised Guidance document and extended summary for policymakers to engage with parallel activities
- September 2025, “subject to funding”
- So far, no volunteers for funding
- Suggest to postpone

Scientific underpinning

Focus issue of ERL

"Focus on Resolving the Global Nitrogen Dilemma - Opportunities and Challenges"

Proposed contributions:

Winiwarter et al., Nitrogen budgets: quantifying environmentally relevant flows of reactive nitrogen compounds on a national scale

Djukic et al., Austrian Nitrogen Budget according UNECE guidance

Dragosits et al., Scotland

Moldan et al., Sweden

Conclusions

- EPNB activities are well on track
- Feedback / endorsement of TFRN is needed
- Status will be presented at WGSR and at informal meeting (May 19)
- Material to support national experts to establish NNBS is complete
- EPNB is looking forward to country activities (as outlined in Dessau, 2024)





Revision of the Gothenburg Protocol: TFRN specific items

Till Spranger, WGSR Chair

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Reminder: Air Convention, Gothenburg Protocol, revision



- 1979 *LRTAP Framework Convention (in the midst of the Cold War)*
- 1983 -> *Various single-pollutant Protocols implementing the Convention*
- 1999 / 2012 *Gothenburg Protocol / Amendments: multi-pollutant, multi-effect*
- 2016/19 - 2022 *Comprehensive **Review** based on thorough scientific assessment*
- Dec 2023 *Executive Body **Decision** 2023/5 to revise the GP as amended in 2012*
- Dec 2024 *EB decides detailed **Plan** on how to deal with 8 main revision issues, keeping in mind non-Parties*
- 2024 – 26(+x) **Negotiations**

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Main negotiation items (EB Decision 2023/5, OP 2)



- (a) New **emission reduction commitments** (for current GP pollutants)
- (b) **Technical Annexes** (scope and level of ambition)
- (c) further **black carbon** emission reductions
- (d) whether and how to address **methane** emissions
- (e) additional **ammonia** emission reductions
- (f) new **flexibilities** etc. to facilitate ratification & implementation by non-Parties
- (g) overarching, collective **risk-based target(s)** (health and ecosystems/biodiversity)
- (h) **integrated approaches** among climate, energy (*, agricultural*) and air policies

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Gothenburg Protocol Revision Plan



- GPR Plan
 - 1. activities and deliverables related to 8 negotiation items
 - 2. interrelations between items and timing of activities
 - 3. keeping in mind non-Parties
- to be updated in the course of negotiations
- TFRN related items will be discussed at WGSR63 (26-28 May 2025), Heads of Delegation meeting (20-23 October 2025) and thereafter:

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GP revision plan 2025

Meeting	Topics Covered (see para.s 15 & 16 for elucidation)	Recommendations and Decisions anticipated
WGSR 63 May	Items (a) <i>ERCs</i> and (b) <i>TAs</i> in connection with (f) <i>(flexi / new approaches)</i> ; Item (d) <i>CH₄</i>	WGSR recommendations to EB on the topics covered
Heads of Delegation meeting October	Thematic meeting on certain pollutants: Items (c) <i>BC</i> , (d) <i>CH₄</i> and (e) <i>NH₃</i> <i>Discussions on item (a) updating ERCs, ambition level</i>	WGSR recommendations to EB on the topics covered
EB 45 December	Start negotiations on revising Protocol text and annexes <i>Decisions on how to deal with items (a) to (h)</i>	

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GP revision plan 2026

Meeting	Topics Covered (see para.s 17 & 18 for elucidation)	Recommendations and Decisions anticipated
WGSR 64	Updates to items (b) and (f) <i>TAs and Flexibilities</i> Thematic meeting on: <i>Items (g) and (h) Targets / Integration,</i> <i>also in relation to item (a) ERCs</i>	WGSR recommendations to EB on the topics covered
WGSR 65 / informal meeting?	Updates to Technical Annexes including <i>Annex II</i> , and <i>protocol text</i>	WGSR recommendations to EB on the topics covered
EB 46 December	Second set of revisions to text and Annexes (subject to previous decisions)	

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Food for thought: Leuven Workshop Session D Lead Questions

- *How do we reconcile the overall lack of progress in emission reductions of reactive nitrogen, particularly ammonia, with ambitious reduction targets as established e.g. in biodiversity policy?*
- *(How) should annex IX be revised?*
 - *More mandatory measures or voluntary measures / recommendations?*
 - *How does this relate to the discussion on the revision of other Technical Annexes (Section B)?*
- *Which alternative approaches to technical standards to attain significant ammonia emission reductions do you recommend? Are these also addressing NO_x emissions?*

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Leuven WS Session D Summary Results

- *Policy instruments are available to reduce nitrogen pollution (e.g., nitrogen budget & non-technical measures)*
- *The GP revision could be an instrument to help reach the goals of the Kunming/Montreal Global Biodiversity Framework*
- *Majority view to revise Annex IX*
- *Meeting/workshop in Spring/Summer 2025 to discuss the revision of the ammonia guidance document and ideas for ammonia mitigation*

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Next steps



- Discussions at WGSR63 (26-28 May), **HoD mtg (20-23 October)** and EB45 (8-11 December 2025) with potential outcomes listed in GPREv Plan
 - Take into account focus on non-Parties
 - Focus on ammonia, BC and possibly methane reductions
 - Integrate with climate, energy, agriculture, biodiversity, ... policies
- Draft Work Plan 2026/7:
 - 17 items with TFRN participation
 - Cooperation foreseen with TFTEI, TFIAM, TFEIP, TFHTAP and of course WGSR

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Thank you for your attention!



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Update on the NH_3 GD revision

Alberto Sanz-Cobena
Rasmus Einarsson

TFRN-19
On-line
24th April 2025

Outline of the GD and revision team

About 48 contributors to the revision (LA + CA + Editorial team)

Editorial team: Barbara Amon, Shabtai Bittman, Rasmus Einarsson, Kate Mason, Alberto Sanz-Cobena, Mark Sutton)

Ch1. Introduction (Editorial team)

Ch2. Ammonia abatement through a systems approach (Rasmus Einarsson & Alberto Sanz-Cobena)

Ch3. Livestock feeding strategies (Nadège Eduard & Martin Weisbjerg)

Ch4. Livestock housing (Anders Peter Adamsen & Peter Kai)

Ch5. Manure treatment and processing (Laurence Loyon & Sebastian Wulf)

Ch6. Manure storage (Karin Groenestein & Paria Sefeedpari)

Ch7. Manure application (Johanna Pedersen & David Pelster)

Ch8. Synthetic fertilizer application (Andreas Pacholski & Nick Hutchings)

Annex A. Methods for measurements & Quality criteria of publications (Mélynda Hassouna & Jesper Nørlem Kamp)

Brussels workshop

- 23-25th June 2025 (23rd and 25th half days, 24th full day).
- Working on the structure (core-team in collaboration with EU COM).

Timeline for the revision

- Deadline for revised chapters: 15th May 2025
- Revision by editorial team: 15th-22nd May 2025
- Sharing of draft chapters with Workshop Participants: 22 May 2025