

# **Collaboration with TFRN Update of the Ammonia Guidance Document**

Agriculture and Nature Panel  
TFEIP Annual Meeting 29<sup>th</sup> April 2026  
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# Continue the collaboration with TFRN



# Continue the collaboration with TFRN

- The Task Force on Reactive Nitrogen (TFRN) works under the Working Group on Strategies and Review of the UNECE Convention on Long-range Transboundary Air Pollution
- Several Expert Panels have been set up by the TFRN
  - the Expert Panel on Mitigation of Agricultural Nitrogen (EPMAN)
  - the Expert Panel on Nitrogen Budgets (EPNB)
  - the Expert Panel on Nitrogen and Food (EPNF)
  - the Expert Panel on Nitrogen in countries of Eastern Europe Central Caucasus and Asia (EPN-EECCA)

# Continue the collaboration with TFRN

- TFRN provides technical support on options to inform preparations for possible future updating of annex IX to the Gothenburg Protocol
- TFRN considers options for co-mitigation of CH<sub>4</sub> and NH<sub>3</sub> emissions from agricultural sources in the light of the discussion on the EU CH<sub>4</sub> strategy
- TFRN communicates in context of the Heads of Delegation on costs of ammonia mitigation as potential support to encourage implementation of such measures

# Update of the Ammonia Guidance Document

- The Expert Panel on Mitigation of Agricultural Nitrogen (EPMAN)
  - Contributes to updates of the code of good practice for reducing ammonia emissions
  - Contributed to the review of the Gothenburg Protocol
    - Review was finished and may likely result in Protocol revision
    - Annex IX of the Gothenburg Protocol (mitigation measures) stayed unchanged in 2012 => status of mid-1990s!
    - Art. 10(4) explicitly specifies the need to “evaluate ammonia control measures and consider the need to revise Annex IX”

## Options for Ammonia Mitigation

Guidance from the UNECE Task Force on Reactive Nitrogen





# Update of the Ammonia Guidance Document

- Category 1 techniques and strategies: These are well researched, considered to be practical or potentially practical, and there are quantitative data on their abatement efficiency, at least on the experimental scale;
- Category 2 techniques and strategies: These are promising, but research on them is at present inadequate, or it will always be difficult to generally quantify their abatement efficiency. This does not mean that they cannot be used as part of an NH<sub>3</sub> abatement strategy, depending on local circumstances;
- Category 3 techniques and strategies: These have not yet been shown to be effective or are likely to be excluded on practical grounds.

Table 12  
Ammonia emission abatement measures for cattle and pig slurry storage

Abatement measure	NH <sub>3</sub> emission reduction (%)	Applicability	Costs (OPEX) (€ per m <sup>3</sup> /yr) <sup>a</sup>	Extra costs (€ kg NH <sub>3</sub> -N reduced) <sup>b</sup>
Store with no cover or crust ( <i>reference technique</i> )	0		—	—
"Tight" lid, roof or tent structure (cat. 1)	80	Concrete or steel tanks and silos. May not be suitable for existing stores.	2-4	1.0-2.5
Plastic sheeting <sup>c</sup> (floating cover) (cat. 1)	60	Small earth-banked lagoons.	1.5-3	0.6-1.3
Allowing formation of natural crust by reducing mixing and manure input below the surface (floating cover) (cat. 1)	40	Only for slurries with higher content of fibrous material. Not suitable on farms where it is necessary to mix and disturb the crust in order to spread slurry frequently. Crust may not form on pig manure in cool climates.	0	0
Replacement of lagoon, etc., with covered tank or tall open tanks (depth > 3 m) (cat. 1)	30-60	Only new build, and subject to any planning restrictions concerning taller structures.	15 (about 50% cost of tank)	—
Storage bag (cat. 1)	100	Available bag sizes may limit use on larger livestock farms.	2.50 (includes cost of storage)	—
Floating LECA balls, Hexa-Covers (cat. 1)	60	Not suitable for crusting manures	1-4	1-5
Plastic sheeting <sup>d</sup> (floating cover) (cat. 2)	60	Large earth-banked lagoons and concrete or steel tanks. Management and other factors may limit use of this technique.	1.50-3	0.5-1.3
"Low technology" <sup>e</sup> floating covers (e.g., chopped straw, peat, bark, etc.) (cat. 2)	40	Concrete or steel tanks and silos. Probably not practicable on large earth-banked lagoons. Not suitable if materials likely to cause slurry management problems.	1.50-2.50	0.3-0.9

<sup>a</sup> Now: For economic cost of the abatement techniques, see Rais (forthcoming).  
<sup>b</sup> Calculated for storage of pig slurry in stores ranging from 500 to 5,000 m<sup>3</sup> capacity for temperate regions of Central Europe. The reference is slurry with no crust.  
<sup>c</sup> Sheetting may be a type of plastic, canvas or other suitable material.

# Update of the Ammonia Guidance Document

**Coordination team:** Barbara Amon, Shabtai Bitman, Mark Sutton, Alberto Sanz-Cobeña, Johanna Pedersen, Jesper Nørlem Kamp

## Chapters

- Ammonia emission trends and current status. Framework of the revision process (Mark Sutton; UKCEH, INMS)
- Nitrogen management taking into account the whole nitrogen cycle & N/C interactions (Rasmus Einarsson, Swedish University of Agricultural Sciences; Alberto Sanz-Cobeña;
- Livestock housing & feeding strategies (Anders Peter S. Adamsen, Peter Kai & Martin Weisbjerg; Aarhus University & Nadège Eduard, INRAE)
- Manure management (manure processing, additives and AD) (Laurence Loyon, INRAE & Sebastian Wulf, KTBL)
- Measures on synthetic fertilizers (Andreas Pacholski; Thuenen Institute; Nicholas Hutchings, Aarhus University)
- Manure application techniques (Johanna Pedersen, Aarhus University & Wajid Umar; ATB Potsdam)
- Methods for measurements & Quality criteria (Jesper Nørlem Kamp; Aarhus University; Mélynda Hassouna, INRAE).

# Update of the Ammonia Guidance Document

- Work started in 2023 with creation of the core group of researchers and other actors potentially interested and finally involved in the revision process.
- There is a group of c. 30 people from more than 12 countries coordinating the revision of each chapter.
- Expected timeline:
  - Several online meetings
  - Progress discussed in June 2024 in Aarhus
  - Main revision by spring 2025.
  - Workshop with stakeholders was held 23 - 25 June 2025 in Brussels
  - Intensive chapter work after the workshop
  - Currently: all chapters are nearly finalised
  - Most likely expected adoption during EB meeting in Dec 2026



# IPCC methodology report on Short-lived Climate Forcers (SLCFs)

## 4. Coverage:

- Taking into account that this work aims to cover all IPCC inventory sectors with categories where the science is assessed to be robust enough to provide guidance for a Tier 1 methodological approach and have a relative contribution to the global/regional emissions of the species, **species<sup>2</sup>** assessed and potentially covered by the new Methodology Report will be **NO<sub>x</sub>, CO, NMVOCs, SO<sub>2</sub>, NH<sub>3</sub>, BC and OC**, as well as **emissions of primary particulate matter relevant for radiative forcing, as appropriate.**

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<sup>2</sup> Given the uncertainties in the radiative forcing of **H<sub>2</sub>** and taking note that H<sub>2</sub> has not yet been well assessed as a climate forcer by IPCC WGI, H<sub>2</sub> emissions relevant for radiative forcing are to be considered by the authors as an **Appendix** subtitled “Basis for future methodological development” subject to the IPCC’s Principles and Procedures on review and adoption.

# IPCC methodology report on Short-lived Climate Forcers (SLCFs)

## Volume 2. Energy Sector

- *Introduction*
- *Stationary combustion*
- *Mobile combustion*
- *Fugitive Emissions*
- *Other*

## Volume 3. IPPU Sector

- *Introduction*
- *Mineral Industry*
- *Chemical Industry*
- *Metal Industry*
- *Non-Energy products from fuels and Solvent Use*
- *Other*

## Volume 4. AFOLU Sector

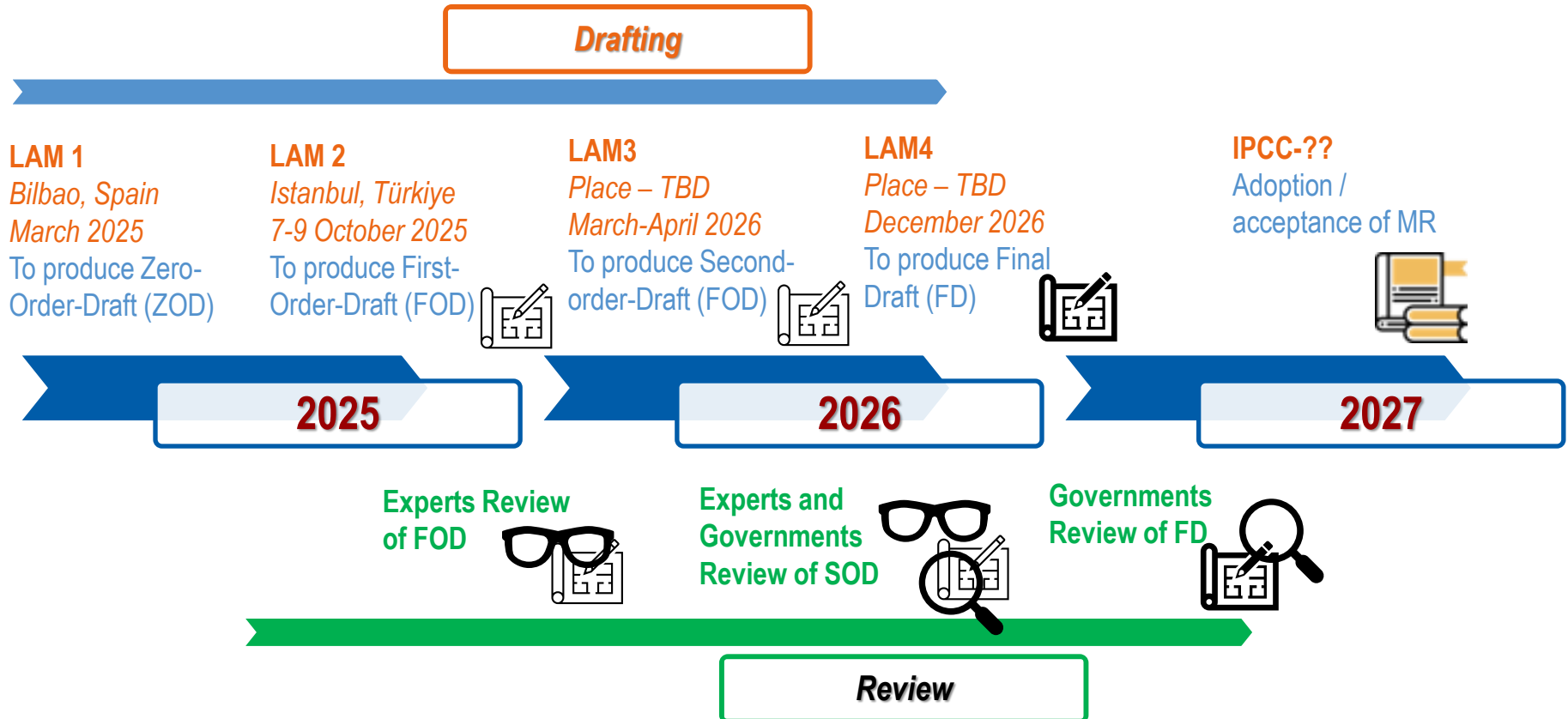
- *Introduction*
- *Generic methodologies*
- *Consistent representation of land*
- *Emissions from Livestock and Manure Management*
- *Land use categories*
- *Managed soil<sup>8</sup>*
- *Other*

## Volume 5. Waste Sector

- *Introduction*
- *Solid Waste Disposal*
- *Biological Treatment of Solid Waste*
- *Incineration and Open Burning of Waste*
- *Wastewater Treatment and Discharge*
- *Other*

# IPCC methodology report on Short-lived Climate Forcers (SLCFs)

## Workplan



# IPCC methodology report on Short-lived Climate Forcers (SLCFs)

## AFOLU team:

- First Lead Author meeting in March 2024 in Bilbao
- First order draft under review after December 2025
- Second Lead Author Meeting April 2026 in Rome
- Second order draft review to be started in September 2026
- Draft of the IPCC methodology report is based on the EMEP / EEA emission inventory guidebook
- NH<sub>3</sub>, NO<sub>x</sub>, NMVOC, PM
- Challenges:
  - Methodology needs to be globally applicable (emission factors, activity data)
  - Little knowledge on NMVOCs, NO<sub>x</sub> and PM
  - Methodology and tables shall be harmonized with GHG reporting
- Thanks for engagement in FOD review and encouragement to engage in expert review of SOD