



Science contributions to the Gothenburg Protocol review process

Laurence Rouil - Chair of the EMEP SB

Jesper Leth Bak - Chair of the WGE

Context

- ▶ To support the GP review process, EMEP SB and WGE provided in 2022 an information document to synthesize science achievements and highlight remaining concerns and future needs.
- ▶ In their 2024-2025 workplan, as adopted in 2023, the CLRTAP science bodies have prioritized actions to support and further document the revision of the Gothenburg Protocol. They include :
 - Supplementary assessment material (trends analyses, effect assessment ..)
 - Updated modelling tools to support IAM
 - Scenario runs to support decision making
- ▶ Science contribution further discussed at the extended EMEP SB and WGE Bureaux meeting held on 28th February-1st March 2024:
 - Need for accounting for impact on ecosystems and biodiversity
 - Consistency of the scientific workplan with respect to the plan for revision of the 2012 GP
 - Time lines
- ▶ Needs for prioritisation/guidance clearly expressed and a list of potential inputs from science bodies with “realistic” deadlines has been provided (see informal documents)

Including environmental targets and biodiversity in the revision process

- ▶ Significant progress made regarding assessment of air pollution on ecosystems (and biodiversity) and good relationships start to develop with the Convention on Biological Diversity.
- ▶ Strong recommendation from WGE to include environmental targets in IAM and optimisation processes.
- ▶ Relevant metrics should be discussed (focus on most sensitive areas, ecosystem or habitat types, or diversity types ...)
- ▶ WGE could update a methodology investigated in the past in collaboration with CIAM/TFIAM: a small working group is to be set-up and will report to the next EMEP SB/WGE meeting in September 2024
- ▶ In the future nature-restoration based processes should be considered in the work priorities of the WGE

WGE contributions within the GP revision timeline

- ▶ In 2024, several ICPs plan to assess environmental impact of scenarios considered in the revision process
 - ICP vegetation : Focus on ozone and methane scenarios (in collaboration with MSC-W)
 - ICP Waters : dynamic modelling to provide insights in lag times between changes in deposition and chemical recovery
- ▶ In 2025, update of material already provided for the review stage could be envisaged to serve an ex-post analysis
 - ICP Waters: water chemistry in 2030 and 2050, dose-response relationships between water chemistry and biology
 - ICP Forests: updates of long-term changes, long-term trends of forest health, growth and biodiversity
- ▶ In 2025, provision of policy-relevant datasets by the CCE:
 - Empirical Critical Loads for Nitrogen (nitrogen related effects of eutrophication, acidification and for biodiversity); including EECCA region
 - SMB Critical Loads for Eutrophication and Acidification including updated NFC data and background database results for EECCA region
 - Dataset of Critical Levels of NH₃ to assess NH₃ related effects for vegetation if relevant

Scenario-derived activities

- ▶ CIAM and TFIAM implement a tight workplan to provide the other groups with relevant scenarios documented in the Policy brief
- ▶ MSC-West main contributors for the provision, a couple of months after scenarios delivery :
 - ▶ EMEP/MSC-W model calculations to provide model output to WGE for ex-post analyses of ecosystem (and material) impacts
 - ▶ Ex-post analysis performed by MSC-W itself: Downscaling EMEP MSC-W model calculations to ~250 m resolution for health impacts analysis
 - ▶ Contribution to the new version of GAINS planned end 2024/early 2025
- ▶ TFMM together with MSC-W and CCC should provide in 2025 additional insights about
 - ▶ ozone, and role of VOCs (2022 intensive observation periods)
 - ▶ Representation of intermediate and semi-volatile condensable emissions in models (ad hoc expert group)
- ▶ TFHTAP will implement a global model intercomparison exercise to document global fluxes with respect to the scenarios. Interim results should be presented to the EMEP SB in September 2025

Emission-related activities

- ▶ TFEIP will report in September 2024 on the needs for improvement of:
 - ▶ the quality of emission inventories (NB: a session dedicated to the propagation of emission uncertainties in IAM is planned as well)
 - ▶ spatial distribution of emissions, assuring consistency across pollutants.
 - ▶ reporting of the condensable part in PM
 - ▶ guidance on estimating BC emissions **if requested for the revision**
- ▶ TFEIP and CEIP will report in 2024 on practicalities and processes required for including CH₄ in annual emissions inventory reporting
- ▶ Future in-depth (stage 3) emissions review processes should help in improving the implementation of the revised protocols
- ▶ At the global scale, TFHTAP will update in 2024 HTAPv3.1, the global emissions mosaic for 2000-2020

Conclusions

- ▶ Timeline for 2024-2025 is very tight and the workplan very ambitious
- ▶ Some actions may need to be prioritised with respect to policy bodies expectations and workplan :
 - ▶ Selection of scenarios
 - ▶ Impact metrics
 - ▶ Condensable, BC, CH4
 - ▶ ...
- ▶ All suggestions/recommendations very welcome

Thank you for your attention !