

## EMEP SB/WGE inputs into the Gothenburg Protocol revision process

Table below presents summary of the inputs planned by ICPs/TFs/centres.

	Date	Responsible	Deliverable	Workplan item/comment
1	Already available	ICP Vegetation	Ozone impacts on crop production and deciduous forest biomass increment for 2015, 2030 and 2050, using the CLE, MFR and LOW scenarios	Presented (in brief) in Annex II of the Gothenburg Protocol Review report
2	Already available	ICP Integrated Monitoring	Report on dynamic modelling at the Swedish IM sites with a focus on modelling vegetation	1.1.1.26 relevant for ex-post analyses/dynamic modelling work
3	Already available	ICP Waters	Impacts of reduced air pollution on surface water chemistry for 1990-2020 across Europe and North America (published report)	Can be included in GP review report.
4	Already available	ICP Waters	Impacts of reduced air pollution on biological recovery / species richness in lakes and rivers in Europa (published report).	Can be included in GP review report.
5	Mid-April 2024	TFIAM	Scenarios	
6		ICP Integrated Monitoring	Data from the IM sites	Relevant for dynamic modelling and potentially co-operation with CDM
7	End of April 2024	TFHTAP	Draft plan for multi-model global experiments (HTAP3-OPNS) to simulate scenarios to be provided by CIAM	1.1.4.2
8	2023-2024	ICP Integrated Monitoring	Open publication of data	Indirectly relevant, will facilitate analyses by other parties
9	End-May 2024	CEIP	Gap-filled air emission data set as used in EMEP models (sectoral data, national totals)	
10	5th June 2024	CEIP	Gap-filled and gridded air emission dataset for 2022 for the main pollutants	
11	Spring/summer 2024	ICP Vegetation	Ozone impacts on grassland across the EMEP domain, which can be linked to impacts on biodiversity (for 2015, 2030, 2050, CLE, MFR, LOW scenarios)	Could do, with no 'external' requirements These will include maps and summary tables for the different scenarios/years. => very short bespoke report
12	Spring/summer 2024	ICP Vegetation	Methane scenario data from EMEP MSC-W (2015,2030, 2050, CLE and LOW scenarios) investigating what happens if background methane concentrations increase and the impact of Rest of the World emissions, compared to Regional.	To investigate how ozone impacts (for example, % yield loss for crops, % biomass loss for deciduous trees) vary with changes in methane, in order to make some conclusions on the importance of methane as an ozone precursor. These will include maps and summary tables for the different scenarios/years. =>very short bespoke report
13	At least 2 weeks per scenario	ICP Vegetation	If any new GP review scenarios are introduced from the modelling teams, ICP Vegetation would need some time to process any results on ozone impacts to allow the ex-post analysis, for example	Could be done with additional scenario data, with processing by MSC-W as an intermediate step, => very short bespoke report
14	End-June 2024	CEIP	Gap-filled and gridded air emission dataset heavy metals and POPs	
15	End-June 2024	CEIP	Gap-filled and gridded air emission dataset for 1990 to 2021 for the main pollutants	
16	May – Sept 2024	TFEIP	TFEIP paper for EMEP SB on including CH <sub>4</sub> in the GP	1.1.2.1
17	May – Sept 2024	TFEIP	TFEIP paper for EMEP SB on improving the quality of emissions inventories	1.1.2.7

18	Summer 2024	TFHTAP	Database for model results established on the AeroCom server, hosted at Met Norway (initially empty)	
19	May 2024 – Sept 2025	TFEIP	Updated guidance on gridding emissions (updated EMEP/EEA Guidebook chapters)	1.1.2.6
20	May 2024 – May 2026	TFEIP	Guidance on estimating of Party's reported PM of condensable component of PM emissions inventories	1.1.2.3
21	Q4 2024	CEIP	Investigate practicalities and processes required for including CH <sub>4</sub> in annual emissions inventory reporting	1.1.2.1
22	Q4 2024	CEIP	Improve spatial distribution of emissions, assuring consistency across pollutants. Explore new data sources	1.1.2.5
23	Q4 2024	TFHTAP	HTAPv3.1, update of global emissions mosaic for 2000-2020	1.1.4.1
24	Q4 2024	TFHTAP	Web-based workshop to discuss early global modeling results of scenarios provided by CIAM, including output from MSC-W	1.1.4.2
25	2024	ICP Integrated Monitoring	Scientific article on vegetation community stability will investigate stability as a response metric related to deposition	1.1.1.26 historical deposition rather than scenarios
26	2024	TFMM	Investigate monitoring of chemicals of emerging concern. Follow up conclusions and guidelines from workshop in autumn 2023	1.1.1.2 Report from workshop
27	2024	TFMM	Survey on aerosol chemical speciation from different models and how it can be matched with measurement to assess importance of different sources	1.1.1.3
28	2024	ICP Waters	Dynamic modelling of water chemical responses to deposition scenarios in one specific region, surface waters (depending on availability EMEP scenarios)	Provides insights in lag times between changes in deposition and chemical recovery
29	End of 2024	TFIAM	EPCAC document on multiscale modelling	2.1.4
30	+ a couple of months from when CIAM delivers scenarios	MSC-W	EMEP/MS-CW model calculations based on the scenarios and providing model output to WGE for ex-post analyses of ecosystem (and material) impacts	MSC-W direct input to the revision process will be mainly related to the scenarios that CIAM will produce
31	+ a couple of months from when CIAM delivers scenarios	MSC-W	Ex-post analysis that will be performed by MSC-W itself: Downscaling EMEP MSC-W model calculations to ~250 m resolution in order to be able to analyze e.g. compliance with AAQD or WHO	
32	Tbd, pending questions from WGSR	MSC-W	Scientific understanding of condensables & IVOCs as well as other relevant issues (CH <sub>4</sub> and O <sub>3</sub> , BC)	
33	First version - EB 44, final version - EB 45	TFIAM	Document on non-technical and structural measures	2.2.3
34	Pending new version of GAINS	MSC-W	Work on updating the GAINS model for simulating O <sub>3</sub> response to precursor emission reductions	New version of GAINS is planned to be ready end 2024/early 2025
35	Pending decisions by EMEP SB/WGSR/EB	TFEIP	Develop guidance on estimating BC emissions	1.1.2.4
36	2024/2025	TFMM	Peer-reviewed publication on Eurodelta BaP	1.1.1.8
37	Spring 2025	TFHTAP	Summary of initial findings from multi-model global modeling results and status of multi-model intercomparison	1.1.4.2

38	2025	ICP Integrated Monitoring	Update in long-term changes in atmospheric deposition and runoff water chemistry of sulfate, inorganic N and acidity	1.1.1.30
39	2025	ICP Waters	Update of water chemistry in 2030, 2050 for key European ICP Waters sites calculated using the SSWC model (depending on availability, EMEP scenarios); needs some processing	Builds on earlier assessment for GP review (already available for GP review report).
40	2025	ICP Waters	Dose-response relationships between water chemistry and biology	1.1.1.12. Potentially providing insights in lag times between chemical recovery and expected biological recovery
41	WGSR 25	ICP Modelling & Mapping	Policy relevant dataset based on Empirical Critical Loads for Nitrogen (nitrogen related effects of eutrophication, acidification and for biodiversity); including EECCA region	1.1.1.22 and 1.1.1.23
42	WGSR 25	ICP Modelling & Mapping	Dataset of Critical Levels of NH3 to assess NH3 related effects for vegetation	1.1.1.24: Policy relevance not discussed yet, could be used in IAM, not discussed with ICP M&M, TFIAM, WGE/EMEP yet
43	September 2025	ICP Modelling & Mapping	Policy relevant dataset on SMB Critical Loads for Eutrophication and Acidification including updated NFC data and background database results for EECCA region	1.1.1.21 together with 1.1.1.25
44	September 2025	TFHTAP	Interim analysis of global modeling scenarios and model intercomparison to be presented at the joint meeting of the EMEP SB and WGE	1.1.4.2
45	September 2025	ICP Forests	Update of long-term changes in atmospheric deposition and air pollution	Scientific paper/contribution to a report
46	WGSR, EB, 2025	TFIAM	Updated version of the policy brief	2.1.12
47	2025	TFMM	Contribution of VOCs on high O3 pollution episodes using observations from intensive measurement period (summer 2022) and regular time series from EMEP network. Including model intercomparison exercise for intensive measurement week	1.1.1.1 EMEP reports (MSC-W) Peer-reviewed publication describing campaign and key results Summary of model intercomparison exercise
48	2025	TFMM	Consolidate representation of intermediate and semi-volatile condensable emissions in models and validation against existing observations of PM composition	1.1.1.4 Contribution to EMEP report (ad-hoc group?)
49	2025	TFMM	Summary report on BaP-related health effects	
50	December 2025/ January 2026	ICP Forests	Long-term trend of forest health, growth and biodiversity in relation to atmospheric deposition, air pollution and climate.	Scientific paper/contribution to a report
51	Spring 2026	TFHTAP	Full set of HTAP3-OPNS global model outputs is provided in the database.	1.1.4.2
52	Summer 2026	TFHTAP	Report is prepared by TFHTAP based on the available model runs	1.1.4.2
53	September 2026	TFHTAP	Report is presented to the joint meeting of the EMEP Steering Body and WGE	1.1.4.2
54	September 2026	ICP Forests	Heavy metal impacts on forest soils and tree nutrition status	ICP Forests Brief