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Executive Body for the Convention on Long-range
Transboundary Air Pollution

Steering Body to the Cooperative Programme for
Monitoring and Evaluation of the Long-range
Transmission of Air Pollutants in Europe

Working Group on Effects

Ninth joint session

Geneva, 11–15 September 2023

Item 10 of the provisional agenda

Summary of 2024–2025 workplan for the implementation of the Convention (science part)

Draft 2024–2025 workplan for the implementation of the Convention (science part)

Summary

The present document was compiled by the Chairs of the Working Group on Effects and the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe based on the contributions submitted by the centres and task forces under the two scientific bodies of the Convention on Long-range Transboundary Air Pollution. The document contains the elements related to science of the draft 2024–2025 workplan for the implementation of the Convention.

I. Introduction

1. The workplan for the implementation of the Convention on Long-range Transboundary Air Pollution translates the vision, objectives and strategic approaches set out in the Long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (Executive Body decision 2018/5).¹ The workplan structure builds on the primary needs of the Convention and its Parties, relating to five main areas: science; policy; compliance; capacity-building; and communication and outreach. For each area, a table presents the specific activities planned, deliverables, the lead body or bodies and resource requirements or funding source.

2. This approach to structuring the workplan allows Parties to better assess the work of the different subsidiary bodies and their deliverables in meeting the Convention's needs and ensuring progress in realizing the vision set out in the long-term Strategy. The draft workplan includes activities that should be completed in the period 2024–2025. Long-term activities and related deliverables are set out in the mandates (terms of references) for the task forces and centres under the Convention.

¹ All Executive Body decisions referred to in the present document are available at <https://unece.org/fr/node/4188>.

II. Science

3. Science project activities in the period 2024–2025 are presented in the table below.

Science

<i>Workplan item</i>	<i>Activity description/objective</i>	<i>Expected outcome/deliverable</i>	<i>Lead body(ies)</i>	<i>Resource requirements and/or funding source</i>
1.1 Improving tools to assess air pollution and its effects in the United Nations Economic Commission for Europe region				
1.1.1 Monitoring and modelling tools				
1.1.1.1	Assess contribution of VOCs on high O ₃ 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	EMEP reports in 2024 and 2025, Peer-reviewed publication describing campaign and key results Summary of model intercomparison exercise	TFMM, CCC, MSC-W	EMEP budget
1.1.1.2	Investigate monitoring of chemicals of emerging concern. Follow up conclusions and guidelines from workshop in autumn 2023	Report from workshop in 2024. Follow up results in EMEP report 2025	TFMM, CCC, MSC-E	EMEP budget
1.1.1.3	Collect available information on aerosol chemical speciation from different models and how it can be matched with measurement to assess importance of different sources	Overview of models' performance indicators (aerosol chemical composition)	TFMM, MSC-W, CCC	Additional resources required
1.1.1.4	Consolidate representation of intermediate and semi-volatile condensable emissions in models and validation against existing observations of PM composition	Working paper (condensables) EMEP reports in 2024 and 2025	TFMM, MSC-W, CCC, CEIP	EMEP budget
1.1.1.5	Review source-receptor methodologies: brute force and sensibilities (local fractions) and their applicability	EMEP reports in 2024 and 2025	MSC-W, TFMM, TFIAM, EMEP budget CIAM, TFHTAP	
1.1.1.6	Update GAINS for simulating O ₃ response to precursors' emission reductions	Updated GAINS model	CIAM with MSC-W, TFHTAP	EMEP budget
1.1.1.7	On basis of recent evidence, long-term trends and uncertainty in future projections, provide insight into robustness of modelled long-term O ₃ projections in relation to CH ₄ mitigation	Synthesis of O ₃ mitigation options	TFMM, MSC-W, TFHTAP	EMEP budget
1.1.1.8	Finalize Eurodelta-BaP model intercomparison. Assess BaP-related health effects	Peer-reviewed publication	TFMM, MSC-E	Additional resources required

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1.1.1.9	Monitor and assess impact on environment of corrosion and soiling effects on materials and their trends	Report on dose-response functions for trend materials (2024) Technical manual for 2024–2025 exposure for trend analysis (2025)	ICP Materials	Recommended contributions
1.1.1.10	Gather information on policy-relevant user-friendly indicators to evaluate air pollution effects on materials by conducting case studies on UNESCO cultural heritage sites	Risk assessment for selected monuments based on retrospective trends in 2000, 2010 and 2020 and EMEP 01° x 01° data (2024) Cost assessment for selected monuments based on retrospective trends in 2000, 2010 and 2020 and EMEP 01° x 01° data (2025)	ICP Materials	Recommended contributions
1.1.1.11	Update ICP Waters Manual	New updated version of ICP Waters Manual (2024)	ICP Waters	Recommended contributions, in-kind contributions from participating countries
1.1.1.12	Assess dose-response relationships between water chemistry and biology	Thematic report (2025)	ICP Waters	Recommended contributions
1.1.1.13	Assess airborne deposition to mosses relating to: (a) CfD for moss survey 2025–2026 on HM, N, POPs and microplastics (b) Report on results from 2020–2021/22 moss survey on HM, N and POPs (c) Report of survey of microplastic content of mosses (2022/2023) and potential for use of mosses as bioindicators of airborne microplastics	Annual progress report (final report for this survey 2029) Report (2024) Report (2024/2025)	ICP Vegetation ICP Vegetation ICP Vegetation	In-kind contributions from participating countries, United Kingdom and CEH
1.1.1.14	Develop state of knowledge report: Impacts of O ₃ on C sequestration in Europe	Report (2025)	ICP Vegetation, ICP Forests	United Kingdom and CEH
1.1.1.15	Review critical levels for NO _x	Report (2024)	ICP Vegetation	United Kingdom and CEH

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1.1.1.16	Quantify N deposition and its effects on forest health, productivity, C sequestration and biodiversity	Report and scientific paper on status and trends of N levels in European forests (2024, 2025)	ICP Forests	Recommended contributions
1.1.1.17	Analyse status and trends of HM in forest ecosystems	Scientific paper (2024) and ICP Forests Brief (2025) on HM concentrations in level I plots across Europe	ICP Forests	Recommended contributions
1.1.1.18	Investigate air pollution-related cause-effect relationships in forests in a changing climate	Book chapter “Long-term trends in environmental conditions and their effects on forest ecosystem functions and services”	ICP Forests	Recommended contributions
1.1.1.19	Quantify ambient O ₃ levels and effects on forest health, productivity, C sequestration, and biodiversity	Book chapter “Long-term trends in visible foliar injury induced by ozone”	ICP Forests	Recommended contributions
1.1.1.20	Define Dynamic Modelling indicators for protection of biodiversity and Dynamic Modelling outputs	Instructions for 24/25 CfD	ICP M&M, CDM	IVL
1.1.1.21	Launch 24/25 CfD to: (a) update SMB CL; and (b) include dynamic modelling of biodiversity	CfD: results to be included in CCE status report	ICP M&M, CCE, CDM	UBA, IVL and recommended contributions
1.1.1.22	Empirical Critical Loads: map exceedance data, including CfD 23/24 outcome and updated 2022 receptor map	Included in CCE status report	ICP M&M, CCE	UBA and recommended contributions
1.1.1.23	Update policy relevant CL data set based on outcomes of items 1.1.1.21–1.1.1.22	Dataset: results to be included in CCE status report	ICP M&M, CCE	UBA
1.1.1.24	Critical Levels of NH ₃ : map exceedance data	Included in CCE status report	ICP M&M, CCE	UBA
1.1.1.25	Update background database for EECCA (with, e.g., updated 2022 receptor map)	Included in CCE status report	ICP M&M, CCE	UBA
1.1.1.26	Elaborate scientific paper on effects of N and S deposition on vegetation community stability over time	Scientific paper (2024)	ICP IM	Recommended contributions
1.1.1.27	Elaborate scientific paper/report on: (a) trends in HM fluxes across ICP IM sites; and (b) assessment of	Scientific paper(s)/report(s) (2024/25)	ICP IM	Recommended contributions

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	mercury data gathered by new passive samplers			
1.1.1.28	Make ICP IM database open access under feasible licence and principles, and publish associated data paper	Data paper and open publication of database and metadata (2025)	ICP IM	Recommended contributions
1.1.1.29	Initiate revision and update of IM manual	Beginning rolling revision of manual, will continue into next workplan (2024/25)	ICP IM	Recommended contributions
1.1.1.30	Provide update in long-term changes in atmospheric deposition and runoff water chemistry of sulfate, inorganic N and acidity	Scientific paper or report (2024/25)	ICP IM	Recommended contributions
1.1.1.31	Elaborate proof of concept for development of above-ground vegetation monitoring in ICP IM sites using drone remote sensing	2025	ICP IM	Additional resources required
1.1.1.32	Consolidate existing evidence on health outcomes of exposure to air pollution	Report on methods for health risk/impact assessment of air pollution and cost-benefit analysis (update to HRAPIE project) Exploratory analysis of recent developments on O ₃ and health	TF-Health with other groups (TFIAM, TFMM)	Recommended contributions, additional resources required Additional resources required
1.1.1.33	Further develop methodologies for assessment of direct and indirect impacts of long-range transboundary air pollution on human health	Update of tools for quantification of health impacts of air pollution, including links to climate change mitigation Case studies of estimating health co-benefits and trade-offs between climate change and clean air agendas	TF-Health	Recommended contributions, additional resources required
1.1.2 Emission and projection tools				
1.1.2.1	Investigate practicalities and processes required for including CH ₄ in annual emissions inventory reporting	Status report (2024)	TFEIP, CEIP	Additional resources required

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1.1.2.2	Support Convention activities investigating revisions to emissions inventory reporting commitments specified under Gothenburg Protocol	Report on feasibility and practicalities associated with revisions to emissions inventory reporting commitments (2025)	TFEIP	Additional resources required
1.1.2.3	Develop guidance on estimating and Party's reporting of emissions of condensable component of PM	Improved consistency of Party's reported PM emissions inventories (2024 and 2025)	CEIP and TFEIP with MSC-W and TFMM	Additional resources required
1.1.2.4	Develop guidance on estimating and Party's reporting of emissions of BC	Status reports, improved quality of Party's emissions inventories of clearly defined pollutant/metric (2024–2025)	TFEIP and CEIP with TFMM	Additional resources required
1.1.2.5	Improve spatial distribution of emissions, assuring consistency across pollutants. Explore new data sources	Updated spatial distribution of emission inventories (2024)	CEIP with IIASA/CIAM	Additional resources required
1.1.2.6	Improve data for modellers: comparison of EMEP gridded emissions with other sources (CAMS, GAINS, EDGAR, Fairmode)	Updated EMEP gridded emissions (2024–2025)	CEIP with MSC-W and CAMS, JRC, Fairmode, TFMM, TFHTAP, TFEIP, expert panel on user engagement	EMEP budget
1.1.2.7	Investigate centralizing some emission estimates from sources such as shipping, forest fires, agricultural soils	Status report (2024)	TFEIP	Additional resources required
1.1.2.8	Refine gap-filling of reported shipping emissions	Updated methodologies and emission data sets (2025)	CEIP	EMEP budget
1.1.2.9	Improve methods for gap-filling of HM and POPs data sets	Updated methodologies and emission data sets (2025)	CEIP	EMEP budget
1.1.3.1	Contribute to Gothenburg Protocol revision as mandated by Executive Body	Pending decision by Executive Body in December 2023	TFIAM, CIAM, TFMM, MSC-W, CCC, TFHTAP, CCE	EMEP budget and recommended contributions
1.1.3.2	Support policy process with scenario analyses	Calculation and analysis of scenarios	CIAM, MSC-W, TFHTAP, TFIAM	
1.1.3.3	Stimulate national integrated assessment capacity and exchange experiences	Notes and recommendations from TFIAM 53 and 54	TFIAM	National contributions

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1.1.3.4	Integrate knowledge from science bodies in integrated assessment framework and support policy process with scenario analyses	Specification of “optimized scenarios”, “optimized and equity scenario”, “ozone precursor scenarios”, “health in cities scenarios”	CIAM, MSC-W, TFHTAP, TFIAM	Additional resources required
1.1.3.5	Update, refine and further develop GAINS model, including new scientific findings on local health impacts, condensables, emissions of NO _x and NMVOC from soil and implications of hydrogen economy. Update emission projections at global level, including mercury	Updated version of GAINS Updated assessment of emissions and projections of mercury at global level	CIAM	EMEP budget
1.1.4 Linking the scales				
1.1.4.1	Continue to explore extension and expansion of global emissions mosaics, building on HTAPv3	Status updates to be included in task force annual reports	TFHTAP	Parties’ in-kind contributions
1.1.4.2	Organize new global and regional model simulations of historical trends and future scenarios for Gothenburg Protocol pollutants	Initial findings assessment (2025)	TFHTAP, TFMM	Parties’ in-kind contributions
1.1.4.3	Organize new global Hg model simulations	2010–2020 baseline simulations (2024); additional sensitivity analyses (2025)	TFHTAP, MSC-E	Parties’ in-kind contributions
1.1.4.4	Design multi-model intercomparison of multi-pollutant (PM, POPs, metals, O ₃) impacts of fires	Options paper (2024)	TFHTAP, MSC-E	Additional resources required
1.1.4.5	Continue to produce emulators for multi-model ensembles and incorporate these into screening models and decision support tools (building on openFASST concept)	Tool updates, workshop (2024)	TFHTAP	Parties’ in-kind contributions
1.1.4.6	EPCAC activities	Activity report together with TFIAM report Annual meetings of EPCAC 5 and 6	TFIAM with nominated experts	Parties’ in-kind contributions
1.2 Cooperation with Parties				
1.2.1	Capacity-building for health impact assessment of air pollution at regional and subregional levels	Development and implementation of capacity-building	TF-Health	Recommended contributions, additional

<i>Workplan item</i>	<i>Activity description/objective</i>	<i>Expected outcome/deliverable</i>	<i>Lead body(ies)</i>	<i>Resource requirements and/or funding source</i>
		curriculum to address different needs		resources required
1.2.2	Stimulate national integrated assessment capacity in EECCA, Türkiye and West Balkan countries	Application of updated GAINS multiscale model/EMEP/uEMEP Workshop on GAINS scenarios	MSC-W and CIAM with CEIP, TFIAM, TFTEI	
1.2.3	Regular coordination with task forces and expert groups on CH ₄ , O ₃ , N	Meeting notes	TFIAM, TFHTAP, TF-Health, TFRN, FICAP	
1.3 Cooperation with other projects and bodies (outreach activities)				
1.3.1	Contributing to outreach work of FICAP, by providing technical content and guidance, including on emissions inventory compilation and management, non-technical measures and economic instruments	Emissions inventory guidance documentation (2024, 2025) Contribution to targeted webinars to be organized by TFICAP	TFEIP, TFIAM, TFMM	Additional resources required
1.3.2	Cooperate with CAMS	Implementation on near real time facilities	CCC	CAMS
1.3.3	Support Stockholm Convention in relation to atmospheric observations and data management	Report to annual joint sessions of Steering Body to EMEP and WGE	CCC, MSC-E	
1.3.4	Support Minamata Convention in relation to atmospheric observations and data management Contribute to Minamata Convention's effectiveness evaluation	Report to annual joint sessions of Steering Body to EMEP and WGE	CCC, TFHTAP, MSC-E	
1.3.5	Contribute to update of WMO low-cost sensor review	Report	TFMM, WMO/GAW	Additional resources required
1.3.6	Promote health messages related to air pollution in Europe	Formulation of health messages in air pollution Risk communication activities for different stakeholders	TF-Health, secretariat	Additional resources required
1.3.7	Cooperation with Climate and Clean Air Coalition	Report to annual joint sessions of EMEP SB/WGE	EMEP with TFEIP, TFHTAP, TFMM, secretariat	Additional resources required
1.3.8	Cooperation with Arctic Council and AMAP	Focus on BC in framework of	CEIP, CIAM, MSC-W, secretariat	AMAP, Additional

<i>Workplan item</i>	<i>Activity description/objective</i>	<i>Expected outcome/deliverable</i>	<i>Lead body(ies)</i>	<i>Resource requirements and/or funding source</i>
		European Union contract		resources required
1.3.9	Outreach activities to increase visibility and understanding of Convention	E-learning course on broader effects-related work under Convention	WGE, secretariat ²	Additional resources required
1.3.10	Promotion of guidance documents, including those recently adopted	Explore opportunities to promote guidance documents, including those recently adopted within and outside ECE	TFIAM	

Abbreviations: AMAP, Arctic Monitoring and Assessment Programme; BaP, benzo[a]pyrene; BC, black carbon; C, carbon; CAMS, Copernicus Atmosphere Monitoring Service; CCC, Chemical Coordinating Centre; CCE, Coordination Centre for Effects; CDM, Centre for Dynamic Modelling; CEIP, Centre on Emission Inventories and Projections; CfD, call for data; CH₄, methane; CIAM, Centre for Integrated Assessment Modelling; CEH, Centre for Ecology and Hydrology; CL, critical loads; CLemp, empirical critical loads; EECCA, Eastern Europe, the Caucasus and Central Asia; EDGAR, Emission Database for Global Atmospheric Research; Gothenburg Protocol, Protocol to Abate Acidification, Eutrophication and Ground-level Ozone; EMEP, Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe; EPCAC, Expert Panel on Clean Air in Cities; FICAP, forum for international cooperation on air pollution; GAINS, Greenhouse Gas and Air Pollution Interactions and Synergies model; Hg, mercury; HM, heavy metals; HRAPIE, Health Risks of Air Pollution in Europe; HTAPv3, Hemispheric Transport of Air Pollutionv3; ICP, International Cooperative Programme; ICP Forests, ICP on Assessment and Monitoring of Air Pollution Effects on Forests; ICP IM, ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems; ICP Materials, ICP on Effects of Air Pollution on Materials, including Historic and Cultural Monuments; ICP M and M, ICP on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends; ICP Vegetation, ICP on Effects of Air Pollution on Natural Vegetation and Crops; ICP Waters, ICP for Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes; IIASA, International Institute for Applied Systems Analysis; IM, integrated monitoring; IVL, IVL Swedish Environmental Research Institute; JRC, Joint Research Centre; Minamata Convention, Minamata Convention on Mercury; Modelling and Mapping Manual, Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends; MSC-E, Meteorological Synthesizing Centre-East; MSC-W, Meteorological Synthesizing Centre-West; N, nitrogen; NH₃, ammonia; NMVOC, non-methane volatile organic compound; NO_x, nitrogen oxides; OpenFASST, open-source FASST Scenario Screening Tool; O₃, ozone; PM, particulate matter; POPs, persistent organic pollutants; SB, Steering Body; SMB, simple mass balance; S, sulfur; Stockholm Convention, Stockholm Convention on Persistent Organic Pollutants; TF-Health, Joint Task Force on the Health Aspects of Air Pollution; TFEIP, Task Force on Emission Inventories and Projections; TFHTAP, Task Force on Hemispheric Transport of Air Pollution; TFICAP, Task Force for International Cooperation on Air Pollution; TFIAM, Task Force on Integrated Assessment Modelling; TFM, Task Force on Measurements and Modelling; TFRN, Task Force on Reactive Nitrogen; TFTEI, Task Force on Techno-economic Issues; UBA, German Environment Agency; uEMEP, urban EMEP; UNESCO, United Nations Educational, Scientific and Cultural Organization; VOC, volatile organic compound; WGE, Working Group on Effects; WMO GAW, World Meteorological Organization Global Atmosphere Watch Programme.

² This activity is also included in section V. Communication, outreach and cooperation