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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

Seventh joint session

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Item 3 of the provisional agenda

Draft 2022–2023 workplan for the implementation of the Convention (science part)

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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 (EMEP) 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 2022–2023 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 2022–2023. The proposed workplan for the two upcoming years also includes actions considered as priorities to support the Gothenburg Protocol review process. 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 2022–2023 period 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	Contribute to the Gothenburg Protocol review by: (i) taking stock of long-term trend analysis and key messages for policy effectiveness; (ii) assessing the fitness for purpose of the monitoring and measurement tools to support policy (including recent developments on condensables, for instance)	Notes and contribution for the review of the Gothenburg Protocol (2022)	TFMM, MSC-W, CCC, MSC-E	Covered by the EMEP budget
1.1.1.2	Revising historical PM _{2.5} emissions from residential combustion to consistently include condensable organics and assessment of the implication for the review of the Gothenburg Protocol	Analysis of emission data sets including condensables for 2005–2018, EMEP MSC-W model calculation of PM trends and source-receptor matrices Contribution of condensables to population exposure and health impacts review (spring 2022, review during the EMEP Task Force meetings and the eighth joint session of Steering Body to EMEP and WGE)	MSC-W in co-operation with CIAM, CCC, CEIP and TNO	Funding from Nordic Council of Ministers or other sources
1.1.1.3	Prepare and conduct an intensive measurement period focused on improved understanding of high ozone pollution episodes	New EMEP field campaign (spring–summer 2022)	TFMM, CCC	Covered by the EMEP budget and national contributions
1.1.1.4	Review of the use of in-situ VOC measurements (including high quality and potential complementary sensors or passive methods) for the revision and improvement of chemistry-transport models across a range of spatial scales: from local (industrial and urban) to regional background sites	EMEP report in 2022 Potential implications to revise the profiles of VOC emission reporting (2023)	TFMM, CCC, MSC-W TFEIP	Covered by the EMEP budget
1.1.1.5	Perform a Eurodelta multi-model intercomparison exercise focusing on BaP	First report in 2022 Final report and publications in 2023	TFMM, MSC-E, CCC	Covered by the EMEP budget and national contributions

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		Assessment of the relative importance of residential wood burning		
1.1.1.6	Investigating monitoring of chemicals of emerging concern	Workshop on measurement and modelling of new contaminants (2023)	TFMM, CCC, MSC-E, TFHTAP	Covered by the EMEP budget
1.1.1.7	Preparation of data and model calculations that are necessary for “Multiscale GAINS”	EMEP/MSC-W country to grid (0.3° x 0.2°) based on “brute force”, 5 years of meteorology, 5 source pollutants (PPM, SO ₂ , NO _x , NH ₃ , VOC), extended EMEP domain including EECCA	MSC-W	Covered by the EMEP budget
		Local fraction tracking (sectoral) of PPM with EMEP model (0.1°) “Exposure Correction Factor” and “Exceedance distribution correction” per grid (sector) based on uEMEP		
		(End 2022)		
1.1.1.8	Analysis of changes in chemical regime for N-compounds: is the efficiency of NH ₃ measures changing? Impact on aerosol concentrations and depositions. Is the transport distance of reduced N changing?	Analysis of source receptor calculations for the past and the future (EMEP report 2022)	MSC-W	Covered by the EMEP budget
1.1.1.9	Monitoring and assessment of the impact on the environment of corrosion and soiling effects on materials and their trends	Report of corrosion and soiling data from the exposure for trend analysis 2017–2021 (2022)	ICP Materials	Covered by recommended contributions
		Environmental data report (2023)		
		Report of trends in corrosion, soiling and pollution 1987–2021 (2023)		
1.1.1.10	Gathering information on policy-relevant user-friendly indicators to evaluate air pollution effects on materials by conducting case studies on UNESCO cultural heritage sites	Report on Call for Data – Part VI: Study on the relationship between the environment and the artefact on selected UNESCO sites (2022)	ICP Materials	Covered by recommended contributions
		Report on Call for Data – Part VII: Application of models with increased		

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		resolution on selected UNESCO sites (2023)		
1.1.1.11	Biological recovery and responses to changing water chemistry	Thematic report (2022)	ICP Waters	Covered by recommended contributions
1.1.1.12	Trends in base cations, potential drivers and implications for acidification status and biological recovery	Thematic report (2023)	ICP Waters	Covered by recommended contributions
1.1.1.13	Call for data for moss survey 2020–2021(22) on heavy metals, N and POPs	Annual progress report (Final report 2024)	ICP Vegetation	In-kind contributions from participating countries
1.1.1.14	Ozone flux-based risk assessment for vegetation for air pollution scenarios relating to: (a) the contribution of methane precursors to tropospheric ozone; (b) the application of ozone modified photosynthesis-based flux-response models	Maps and report (2023)	ICP Vegetation in collaboration with MSC-W	United Kingdom
1.1.1.15	Review of ozone pollution and climate change impacts on vegetation – focus on implications for calculation and application of flux-based Critical Levels and risk assessment	Report (2023)	ICP Vegetation	United Kingdom and in-kind contributions from participating countries
1.1.1.16	State-of-knowledge report on “genetics of crop resilience to ozone and potential for crop breeding”	Report (2023)	ICP Vegetation	United Kingdom and in-kind contributions from participating countries
1.1.1.17	N deposition and its effects on forest health, productivity, carbon sequestration and biodiversity	Report and scientific paper on status and trends of N levels in European forests (2022, 2023)	ICP Forests	Covered by recommended contributions
		Publication of the responses of European forest ecosystems to decreasing N deposition		
1.1.1.18	Status and trends of heavy metals in forest ecosystems	Scientific paper on heavy metal concentrations in level I plots across Europe (2023)	ICP Forests	Covered by recommended contributions
	Air pollution-related cause-effect relationships in forests in a changing climate	Impact of climate on foliar nutrition in European tree species (scientific paper in 2023)	ICP Forests	Covered by recommended contributions

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	Effects of air pollution on forest health, productivity, carbon sequestration and biodiversity	Report on the effect of air pollution on forest health and productivity (2023)	ICP Forests	
1.1.1.19	Steady-state Critical Loads: (a) update of National Critical Loads by National Focal Centres; (b) establishment of European Background Database by CCE	Database (2020/2021) for Critical Loads for acidification and eutrophication; Report (2022)	CCE and ICP Modelling and Mapping	National Focal Centres and recommended contributions
1.1.1.20	Empirical Critical Loads: Review and revision of the CLemp N published in 2011 (continued)	Report on empirical Critical Loads in Europe (2022)	CCE and ICP Modelling and Mapping	Covered by CCE, CCE National Focal Centres and by recommended contributions
1.1.1.21	Update of the harmonized Convention receptor map	Harmonized receptor map for Europe (2023)	ICP Modelling and Mapping/CCE	CCE and Germany
1.1.1.22	Critical Levels of ammonia: literature review and empirical data provision supporting a workshop	Organization of an international workshop and workshop report	ICP Modelling and Mapping/CCE	CCE and Germany
1.1.1.23	Modelling interaction between air pollution and climate change: N and C	Expert workshop (2022)	ICP Modelling and Mapping/CDM	CDM and National Focal Centres experts
1.1.1.24	Modelling biodiversity change to set critical loads for N	Report on methodology development and proposal for call for data (2023)	ICP Modelling and Mapping/CDM/CC E	CDM, CCE, and National Focal Centres experts
1.1.1.25	Operationalizing and advertising “IM light” as an attractive monitoring protocol, aiming at adding more ecosystem types in the monitoring by ICP Integrated Monitoring	An extension of the Integrated Monitoring methodology to include two additional levels of monitoring with fewer mandatory variables and an invitation to countries to join (2022)	ICP Integrated Monitoring	Covered by recommended contributions
1.1.1.26	Modelling and assessment of biodiversity and ecosystem impacts	Scientific paper (2023)	ICP Integrated Monitoring and CDM	Covered by recommended contributions
1.1.1.27	Consolidate existing evidence on health outcomes of exposure to air pollution	A report on methods for health risk/impact assessment of air pollution and cost-benefit analysis (update to HRAPIE project) An overview on air pollution and COVID-19 (optional, pending resources)	Task Force on Health in collaboration with other groups, for example, TFIAM Task Force on Health	Expected to be covered by recommended contribution; further funding needed

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1.1.1.28	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 the health impacts of air pollution, including links to climate change mitigation Assessment of health co-benefits and trade-offs between climate change and clean air agendas (optional, pending resources)	Task Force on Health	Expected to be covered by recommended contribution and other potential donors; further funding needed
1.1.2 Emission and projection tools				
1.1.2.1	Planning and delivery of an updated EMEP/EEA Guidebook in 2023	Guidebook delivered (2023)	TFEIP, CEIP and national experts	Covered by national contributions
1.1.2.2	Review new guidance/methods for emissions from solvent and product use (Combustion and industry)	Contribution to the Guidebook (2023)	TFEIP and national experts	Covered by national contributions
1.1.2.3	Agriculture: further clarifying issues around proper accounting of emissions resulting from manure import/export and livestock allocations	Contribution to the Guidebook (2023)	TFEIP and national experts	Covered by national contributions
1.1.2.4	Proposal for an updated projection reporting template	Template adopted by the EMEP Steering Body (2022)	TFEIP and national experts	Covered by the EMEP budget
1.1.2.5	Detailed analysis of the status of inclusion of the condensable component in PM emissions reported by Parties based on the data provided by Parties in their Informative Inventory Reports and on direct communication with Parties for selected Nomenclature for Reporting categories (case studies)	Status reports (2022 and 2023)	CEIP and TFEIP in collaboration with MSC-W and TFMM	Covered by the EMEP budget
1.1.2.6	Improving spatial distribution and gridding processes of BC emissions data by using new data sources (International Institute for Applied Systems Analysis, CORINE Land Cover, population statistics)	Updated BC emission inventories (2021–2022)	CEIP in cooperation with CIAM	Need to find complementary resources
1.1.2.7	Improvement of data for the modellers: comparison of EMEP gridded emissions with	Updated EMEP gridded emissions (2022–2023)	CEIP in collaboration with MSC-W and	Covered by the EMEP budget

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	other sources (CAMS, Fairmode)		CAMS, JRC, Fairmode	
1.1.2.8	Gap-filling of 2020 and 2021 emission data sets (the special conditions in these years (COVID pandemic) will need refinement of the standard approaches)	Updated data sets and report (2022)	TFEIP	Need to find complementary resources
1.1.2.9	Refinement of reporting and gap-filling of the shipping emissions to anticipate changes in modelling	Updated methodologies and emission data sets (2023)	TFEIP and CEIP	Need to find complementary resources
1.1.2.10	Complete refactoring of the WebDab database and the user interface for data queries to state-of-the-art technology, including integration of the gridding system to accelerate the gridding process and provide a more user-friendly access to gridded emissions	Updated WebDab interface (2023)	TFEIP	Covered by the EMEP budget
1.1.3 Integrated assessment tools				
1.1.3.1	Scenario assessment relevant for the Gothenburg Protocol review and potential revision using multiscale GAINS and EMEP/uEMEP and including an extension of the GAINS domain (EECCA/West Balkans/Turkey)	Data and scenario analyses (2022–2023)	CIAM, TFIAM and MSC-W	Covered by the EMEP budget
1.1.3.2	Scenario development for the (potential) revision of the Gothenburg Protocol, including cost-effectiveness analysis of specific measures and assessment of the implication of improved modelling, among others, inclusion of condensables and marine deposition targets	Scenario analyses (2023)	TFIAM and CIAM	Covered by the EMEP budget
1.1.3.3	Assessing observed trends in air pollution at the various scales Linkages between global and regional air pollution	Contribution to the review of the Gothenburg Protocol (2022)	TFMM, TFHTAP, TFIAM and MSC-W	Covered by the EMEP budget
1.1.3.4	Implementation for multiscale GAINS across the whole extended EMEP domain using data elaborated by MSC-W	Updated version of GAINS (early 2022)	CIAM	Covered by the EMEP budget
1.1.3.5	Impact of additional measures: Assess extent of recently implemented (by the Parties) additional measures, including	Report (2022)	CIAM in collaboration with	Covered by the EMEP budget

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	best available technologies, and their respective contribution to meeting obligations		TFTEI, TFEIP, TFRN	
1.1.3.6	Guidance document on non-technical measures and economic instruments	Guidance document (2023)	TFIAM	Need to find complementary resources
1.1.3.7	Perform an evaluation of the impact of potential methane mitigation measures on regional ozone	Report and workshop organized in 2023	TFMM, TFHTAP, MSC-W, TFIAM	Covered by the EMEP budget
1.1.4 Linking the scales				
1.1.4.1	EPCAC activities	Activity report (2022) Two annual meetings of EPCAC (2022 and 2023)	TFIAM with nominated experts	Covered by in-kind contributions from participating countries
1.1.4.2	Attribution of long-term changes of Hg and POP pollution to regional and extra-regional (global, secondary) sources	Analysis of available global Hg and POP emissions inventories (for example, EDGAR, UNEP) for evaluation of long-term pollution changes Model assessment of the role of regional, global and secondary sources in long-term changes of Hg and POP pollution on a global scale, with focus on the EMEP region Technical Report on source attribution of long-term changes of Hg and POP pollution (2021)	MSC-E, TFHTAP, AMAP, UNEP, Stockholm and Minamata Conventions	Covered by the EMEP budget and other resources if possible
1.1.4.3	Development and design of global emission scenarios to explore the mitigation potential in comparison to the baseline with a data set for use in Convention modelling tools	Report (2022–2023)	TFIAM and TFHTAP	
1.1.4.4	Complete the updated global emissions mosaic for traditional air pollutants (HTAPv3, 2000–2018) Incorporate emissions estimates for heavy metals and POPs, the actual work on this	Updated data set (2023) Workshop to be organized in 2022	TFHTAP in cooperation with CAMS, JRC, CIAM, TFEIP TFHTAP, MSC-E, TFEIP, CIAM	Covered by Parties' in-kind contributions

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	is unlikely to begin before 2023			
1.1.4.5	Continue development of the openFASST tool for screening analysis of future scenarios and implications of global and regional model uncertainties	Tool updates (2022,2023)	TFHTAP	Covered by Parties' in-kind contributions
1.1.4.6	Investigating the air-surface exchange rates of Hg	Report (2023)	TFHTAP and MSC-E	Covered by Parties' in-kind contributions
1.1.4.7	Elaborating global source/receptor relationships of combustion-related POPs and PM	Report (2023)	TFHTAP, TFMM and MSC-E	Covered by Parties' in-kind contributions
1.2 Cooperation with Parties				
1.2.1	Country-scale assessment of heavy metal and POP pollution	A case study of Hg pollution in Norway involving national measurement data and modelling (2022–2023)	MSC-E, TFMM, national experts	Covered by the EMEP budget and Norway
1.2.2	Focus on EECCA and West Balkan countries: Implementation of updated information about activities, costs of mitigation options, and improvement of spatial distribution of emissions; development of projections	Application of the updated GAINS multiscale model/EMEP/uEMEP (2022 and 2023 for projections for the potential Gothenburg Protocol revision)	MSC-W and CIAM in collaboration with CEIP, TFTEI	
1.2.3	Capacity-building for the health impact assessment of air pollution at regional and subregional levels	Development and implementation of the capacity-building curriculum to address different needs	Task Force on Health	Expected to be covered by recommended contribution and other potential donors
1.3 Cooperation with other projects and bodies (outreach activities)				
1.3.1	Cooperation with CAMS	Implementation on near real time facilities to report observations (2022)	CCC	Budget provided by CAMS
1.3.2	Cooperation with Climate and Clean Air Coalition	Report to annual joint sessions of Steering Body to EMEP and WGE	EMEP with support from TFEIP, TFHTAP, TFMM	
1.3.3	Cooperation with Arctic Council and AMAP	Focus on BC in framework of a European Union contract	CEIP, CIAM, MSC-W	Budget provided by AMAP (European Union contract)
1.3.4	Support Stockholm Convention in relation to atmospheric observations and data	Report to annual joint sessions of Steering Body to EMEP and WGE	MSC-E	

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	management within the ECE region			
1.3.5	Capacity-building on the health impact assessment of air pollution at the regional and subregional levels	Development and implementation of capacity-building curriculum to address different needs	Task Force on Health	Expected to be covered by recommended contribution and other potential donors
1.3.6	Promote health messages related to air pollution in Europe	Formulation of health messages in air pollution, including on personal-level interventions Workshop on risk communication, including for medical professionals, on health messages related to air pollution to the public and at individual level	Task Force on Health	Covered by the European Commission; further funding needed

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; CEIP, Centre on Emission Inventories and Projections; CIAM, Centre for Integrated Assessment Modelling; CL, critical loads; CLemp, empirical critical loads; COVID-19, coronavirus disease; EECCA, Eastern Europe, the Caucasus and Central Asia; EDGAR, Emission Database for Global Atmospheric Research; EEA, European Environment Agency; 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; GAINS, Greenhouse Gas and Air Pollution Interactions and Synergies; Hg, mercury; HRAPIE, Health risks of pollution in Europe; ICP, International Cooperative Programme; ICP Forests, ICP on Assessment and Monitoring of Air Pollution Effects on Forests; ICP Integrated Monitoring, 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 Modelling and Mapping, 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 on Assessment and Monitoring of Acidification of Rivers and Lakes; IM, integrated monitoring; JRC, Joint Research Centre of the European Commission; 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; NO_x, nitrogen oxides; OpenFASST, open-source FASST Scenario Screening Tool; PAH, polycyclic aromatic hydrocarbon; PM, particulate matter; PPM, primary particulate matter; POPs, persistent organic pollutants; S, sulfur; SO₂, sulfur dioxide; Stockholm Convention, Stockholm Convention on Persistent Organic Pollutants; Task Force on 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; TFIAM, Task Force on Integrated Assessment Modelling; TFMM, Task Force on Measurements and Modelling; TFRN, Task Force on Reactive Nitrogen; TFTEL, Task Force for Techno-economic Issues; TNO, Netherlands Organization for applied scientific research; uEMEP, urban EMEP; UNEP, United Nations Environment Programme; UNESCO, United Nations Educational, Scientific and Cultural Organization; VOC, volatile organic compound; WGE, Working Group on Effects; WGSR, Working Group on Strategies and Review; WMO, World Meteorological Organization.