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

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Report of the Executive Body on its thirty-ninth session

Addendum

Decisions adopted by the Executive Body

Contents

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Decision 2019/1

Monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe for the period 2020–2029

The Executive Body,

Noting the importance of relevant high-quality observational data both for reviewing the progress towards implementation of the objectives of the Protocols and as a basis for scientific work to further develop abatement strategies under the Convention,

Recalling item 1.1.1.1 of the 2018–2019 workplan for the implementation of the Convention (ECE/EB.AIR/140/Add.1) adopted at its thirty-seventh session,

Recalling also the monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe for 2004–2009 (EB.AIR/GE.1/2004/5) approved at the Executive Body's twenty-second session (ECE/EB.AIR/83, para. 17 (e)), decision 2004/1 concerning its implementation and the monitoring strategy for 2010–2019 (ECE/EB.AIR/2009/GE.1/15) approved at the Executive Body's twenty-seventh session (ECE/EB.AIR/99, para. 21 (c)),

Acting in accordance with article 9 of the Convention,

1. *Decides* to adopt the monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe for the period 2020–2029, as set out in the annex;

2. *Urges* Parties within the geographic scope of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe to fully implement the strategy without undue delay;

3. *Requests* the Chemical Coordinating Centre to provide technical support to Parties so that they can fully implement the monitoring strategy;

4. *Requests* the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe to review the implementation of the monitoring strategy at its sessions and to keep the Executive Body informed of progress.

Annex

Monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe for the period 2020–2029

I. Introduction

1. This document presents the monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) for the period 2020–2029. The document was developed through a revision process led by the EMEP Chemical Coordinating Centre in cooperation with the EMEP Task Force on Measurements and Modelling, as mandated by the third joint session of the EMEP Steering Body and the Working Group on Effects in 2017 (ECE/EB.AIR/GE.1/2017/2−ECE/EB.AIR/WG.1/2017/2) and as specified in item 1.1.1.1 of the 2018–2019 workplan for the implementation of the Convention (ECE/EB.AIR/140/Add.1).

2. The Convention on Long-Range Transboundary Air Pollution specifies a number of areas where close collaboration between its Parties is important to achieve its goals. These areas include:

(a) Requirements with respect to instrumentation and other techniques for monitoring ambient concentrations of air pollutants;

(b) The need to exchange meteorological and physico-chemical data relating to processes during transmission of air pollutants; and

(c) The need to use comparable or standardized procedures for monitoring and for the establishment of monitoring stations. The monitoring strategy specifies the detailed requirements for monitoring activities of the Parties to the Protocol to the Convention on Long-range Transboundary Air Pollution on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe.

3. The main objectives of EMEP are to:

(a) Provide observational and modelling data on air pollutant concentrations, deposition rates, emissions and transboundary fluxes on the regional scale and identify the trends in time;

(b) Identify the sources of pollution concentrations and depositions and to assess the response to changes in emissions;

(c) Improve the understanding of chemical and physical processes relevant to assessing the effects of air pollutants on ecosystems, human health, materials and climate, in order to support the development of cost-effective abatement strategies;

(d) Explore the environmental concentrations of new chemical substances that might require the attention of the Convention in the future.

4. The EMEP observations and model calculations are important elements in assessing the air pollution situation in the United Nations Economic Commission for Europe (ECE) region and provide links both to global and to urban scales. Since air pollution is also addressed by other conventions and programmes, EMEP will collaborate closely with them to ensure harmonized approaches and efficient use of resources.

5. At its twenty-second session, the Executive Body for the Convention on Long-range Transboundary Air Pollution adopted a level-based monitoring strategy for the period 2004–2009 (EB.AIR/GE.1/2004/5) and made a decision concerning its implementation (ECE/EB.AIR/83/Add.1, decision 2004/1). Through the decision, the Executive Body:

(a) Urged Parties to make resources available for the full implementation of the strategy at a national level within the geographic scope of EMEP without undue delay;

(b) Requested the Chemical Coordinating Centre to provide technical support to Parties regarding the implementation of the strategy; and

(c) Requested the Steering Body to follow the implementation of the strategy closely, to review it and to keep the Executive Body informed of progress. The strategy was revised for the period 2010–2019 (ECE/EB/AIR/GE/1/2009/15), with minor adjustments compared to the 2004–2009 version.

II. General objectives and requirements

6. The monitoring strategy for 2020–2029 consolidates the established approaches and aspirations for monitoring activities in order to provide consistent and adequate observational data supporting the EMEP objectives. Furthermore, it introduces some minor changes to the specific requirements in order to meet the needs of EMEP for the coming decade.

7. The monitoring activities aim to ensure:

(a) Adequate ongoing long-term monitoring of concentrations and deposition fluxes to assess exposure and impacts on health, ecosystems, vegetation, materials and climate;

(b) Adequate spatial coverage in the geographical domain of EMEP and improved access to information from areas that have been insufficiently covered up to now;

(c) Sufficient temporal resolution to enable investigation of atmospheric processes driving transport and transformation of pollution, to guide model improvements and to enable the analysis of individual pollution events;

(d) Co-located and concurrent monitoring of the relevant atmospheric variables, the adoption and use of standardized methodologies, and adequate quality assurance procedures;

(e) A level of ambition that is affordable for all Parties, while also taking advantage of scientific developments and emerging capabilities.

8. EMEP monitoring is the core framework for regional-scale monitoring of atmospheric constituents throughout the EMEP domain. Observations are made at remote and regional background sites and enable, in combination with other monitoring efforts within the ECE area, the evaluation and assessment of regional and transboundary contributions to local air pollution.

9. EMEP observations are also important for understanding the role of intercontinental and global scale transport of short- and long-lived species playing a role in air pollution and climate change processes. The measurement programme includes radiative forcing agents (also known as short-lived climate pollutants), for example, aerosols (including black carbon) and ozone and their precursors (including methane). EMEP monitoring supports, in an integrated way, information needs associated with coupling between atmospheric composition and deposition rates with the climate system and its variability, as well as the coupling between the carbon and nitrogen cycles.

10. Furthermore, EMEP observations are well-suited to serve as complementary and reliable data for calibration and validation data for airborne and satellite-based remote sensing instrumentation.

11. The EMEP monitoring strategy aims to utilize new developments in observational methods, new technologies and techniques to integrate observations from measurement platforms (for example, in situ, profiles, satellite remote sensing and methods for integrating observational data with modelling through, for example, data assimilation and measurement model fusion approaches).

12. EMEP will, where relevant and appropriate, continue its efforts to increase the monitoring and reporting of parameters and data timelines, facilitating more rapid access to

air pollution information ("Near Real Time" or "Real Real Time" data delivery). Such efforts will be based on voluntary contributions from Parties and will follow the guidance of the EMEP Steering Body.

III. Coordination and cooperation

13. Due to the significant interactions between the suite of chemical constituents and the associated physical properties of air pollutants, as well as the synergies in abatement measures, national and international monitoring efforts should be closely coordinated. Such an approach will be pursued by EMEP to ensure a sound observational basis by combining resources and avoiding duplication of efforts.

14. Taking into account the complexity and costs of atmospheric composition monitoring, EMEP will, as far as possible, continue to harmonize with, and make use of relevant data compiled under, other conventions and frameworks. In particular, such data would include observations of local air quality, climate change, water quality and biodiversity. As a result, there is a significant overlap in technical infrastructures at national levels, i.e. most EMEP level 2 sites (see below) represent core infrastructures for observations supporting related initiatives. Within the Convention, there is close collaboration with the Working Group on Effects and the International Cooperative Programmes, with EMEP observations being used to derive pollution exposure data to assess impacts and effects.

15. At the European level, EMEP observations are fundamental in relation to the European Union Air Quality Directive[1] and the National Emission Ceilings Directive,[2] and there are close links between EMEP monitoring requirements and the Directives. Furthermore, EMEP observations are used as a part of European Environment Agency assessments of the air quality situation in Europe, and EMEP sites typically also deliver parts of their data to the European Environment Agency database.

16. There is close scientific and technical cooperation between EMEP and the World Meteorological Organization Global Atmosphere Watch Programme in Europe, comprised of harmonization of guidelines, observational practices, data quality control, quality assurance and data exchange. Through the efforts of Global Atmosphere Watch, EMEP observations are also harmonized with efforts in other parts of the world, and EMEP data contribute to Global Atmosphere Watch's services to society.

17. Examples of other initiatives and frameworks related to pollution include international programmes and conventions such as: the Arctic Monitoring and Assessment Programme; the Baltic Marine Environment Protection Commission; the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic; the United Nations Framework Convention on Climate Change; the Stockholm Convention on Persistent Organic Pollutants; and the Minamata Convention on Mercury under the United Nations Environment Programme.

18. EMEP observations are also made available to users and stakeholders though initiatives such as the Global Earth Observation System of Systems and the European Union's Earth Observation Programme (COPERNICUS).

[1] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, *Official Journal of the European Union*, L 152 (2008), pp. 1–44.

[2] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, *Official Journal of the European Union*, L 344 (2016), pp. 1–31.

IV. Specification of the monitoring programme (2020–2029)

A. Organization of the monitoring network

19. The monitoring programme is organized in such a way as to enable monitoring stations to operate at three different levels of scope and complexity, each targeting EMEP objectives in different but complementary ways. In addition, EMEP will make use of other relevant supplementary data of adequate quality at a relevant spatial representativeness, for example, the observations from the collaborating programmes and initiatives mentioned above.

20. The main objective of monitoring at level 1 is to provide long-term basic chemical and physical measurements of the basic EMEP parameters. Level 1 activities should be the first priority when extending the monitoring network in areas with few sites, such as Eastern Europe, the Caucasus and Central Asia and South-Eastern Europe. Through the undertaking of a more demanding monitoring programme, a subset of the level 1 stations should gradually be upgraded to include variables required for level 2.

21. Level 2 variables provide a more complete description of the physical/chemical speciation of relevant constituents, which is necessary for assessing air pollution, including long-range transport of air pollutants, and which thus represents an essential supplement to the level 1 activities. The aim is to operate at least 30 sites providing level 2 data throughout the EMEP domain. Level 2 variables are defined according to topics that Parties may choose, with Parties being free to focus on considering their national priorities keeping in mind that, unless relevant, not all topics need to be covered. A site extending its programme to include both level 1 and level 2 requirements will be identified as an "EMEP supersite". This is an important motivating factor and provides appropriate recognition of the data providers. The goal of Level 2 observations is to provide long-term continuous monitoring data using measurement methods traceable to established international quality standards, as is the case with Level 1 observation data.

22. The main objective of Level 3 observations is to improve the scientific understanding of the relevant physico-chemical processes in relation to regional air pollution and its control. Level 3 activities will typically be based on short-term campaign data. Level 3 efforts are often based on methods and approaches for which standardized methods and procedures have not yet been established, and for which a decadal or multi-decadal time series is not realistic. Level 3 observations are a voluntary part of the monitoring activity and will be implemented in collaboration with the broader research community.

B. Specification of observations and variables

23. The specification of variables at the different levels of monitoring is as follows:

(a) Level 1 – Measurements at level 1 include parameters required to describe basic aspects of tropospheric chemistry and deposition rates of substances involved in the atmospheric cycling of particulate matter (PM), photochemical oxidants, acidifying and eutrophying compounds and heavy metals. Requirements also include standard meteorological parameters, but these may be taken from a distant meteorological site if representative;

(b) Level 2 – Measurements of level 2 parameters should be made at a subset of sites at which level 1 measurements are made. The potential additional parameters include: higher temporal resolution; reliable gas/particle distribution information for semi-volatile compounds; speciation of precursors to photochemical oxidants (nitrogen oxides (NOx) and volatile organic compounds (VOCs)); physical and optical characterization of aerosols (including "black carbon"); aerosol optical depth; further chemical speciation of particles (elemental and organic carbon in PM_{10}, mineral dust); tracers to address air mass origin and the role of anthropogenic versus natural influence, methane (CH_4) and halocarbons. For heavy metals, the level 2 programme includes air concentrations of cadmium (Cd) and lead (Pb) (with copper (Cu), zinc (Zn), arsenic (As), chromium (Cr) and nickel (Ni) as a secondary

priority) and mercury (Hg) in precipitation and air (total gaseous mercury (TGM)). Monitoring of persistent organic pollutants (POPs) in level 2 should ideally include measurements, preferably congener or isomer specific, both in air and in precipitation (polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), hexachlorobenzene (HCB), chlordane, hexachlorocyclohexanes (HCHs) dichlorodiphenyltrichloroethane and dichlorodiphenyldichloroethylene (DDT/DDE). Full implementation of all the parameters listed above is, however, not required in order to comply with the monitoring strategy;

(c) Level 3 – level 3 measurements are research-driven and may be partly available at locations other than sites offering level 1 and level 2 data. Interesting parameters for EMEP include: dry deposition flux measurements (sulphur, nitrogen, ozone, VOCs, Hg, others); vertical profiles of ozone and aerosols (soundings or light detection and ranging (LiDAR), observations of POPs and Hg in other compartments than in the atmosphere; chemical speciation of organic carbon (OC) in aerosols, carbon dioxide (CO_2) and nitrous oxide (N_2O) measurements made at EMEP sites in association with other monitoring frameworks; and isotope information on OC and VOCs. This list is not exclusive and other parameters may be added to it as they become relevant for EMEP.

24. The appendix to the present document contains a summary of the parameters recommended to be monitored at the three respective levels, as well as the recommended temporal resolution for measurements.

25. Since the different compounds studied under EMEP are intrinsically linked, it is important that the EMEP monitoring network should consist of co-located and concurrent measurements in both precipitation and air. It is recognized, however, that some measurements may not always be co-located with level 1 sites.

C. Temporal resolution – measurement frequency

26. The temporal resolution for the EMEP mandatory monitoring programme should be sufficient to support the analysis of chemical and physical characteristics of synoptic-scale transport. Thus, the temporal resolution should generally not exceed 24 hours. Higher temporal resolution is recommended where appropriate methods exist. However, Parties can undertake to monitor at a lower temporal resolution when the measurement activity requires significant financial resources, making a continuous time-integrated sampling at 24-hour resolution unrealistic. Similarly, longer sampling times should be considered if concentrations levels are so low that detection levels represent a problem. It should be noted that particular care should be taken to avoid sampling temporal resolution affecting data quality, for example, if methods are subject to sampling artefacts. In such cases, it is recommended to continue the current practice of limiting the sampling to a few short time- integrated samples per week as opposed to long sampling times (for example, weekly or monthly sampling for POPs and VOCs is not recommended).

D. Spatial resolution

27. Monitoring of spatial density should reflect the residence time of the individual pollutants in the atmosphere and should be sufficient to resolve the actual spatial gradients in concentrations and deposition on the regional scale. The site density is defined for each level, while providing for some flexibility.

28. For level 1 variables, it is recommended that there should be at least one to two sites per 100,000 km^2. All Parties with an area greater than 10,000 km^2 are requested to operate at least one site. It is recommended that small countries with large gradients in geography and climate further increase site densities, taking into account the fact that gradients in mountainous regions should also be monitored.

29. For level 2 variables, all Parties with a land area greater than 50,000 km^2 should operate at least one site. As stated in paragraph 21 above, Parties have the possibility to choose and focus on variables reflecting their national priorities. Possibilities for regional

collaboration on the operation of sites should be explored if there are obstacles to or financial constraints regarding the implementation of monitoring programmes. Most of the existing level 2 sites currently contribute to the Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS).

30. Level 3 measurements are voluntary and no specific requirements are set out with respect to site densities. Most Parties already operate sites addressing level 3 components, and efforts should be made to involve relevant scientific groups in the EMEP work. Traditionally, the EMEP Task Force on Measurements and Modelling has arranged a number of intensive campaigns, which have proven to be an essential contribution to EMEP developments. The level 3 measurements can to some extent address priority pollution issues for different subregions, and the availability of data might depend on the availability of research funds and the interest of these subregions in sharing resources and data.

E. Data quality and exchange

31. EMEP will maintain and further improve its quality assurance programme to make sure that observation data are of known quality and adequate for their intended use as defined in section II above. Field intercomparisons and laboratory ring tests are important, as is the maintenance of good communication between national data providers and the EMEP centres. These activities can be strengthened through collaboration with the central quality assurance facilities in the European Union (for example, the Network of Air Quality Reference Laboratories, the European Committee for Standardization, ACTRIS and the World Meteorological Organization Global Atmosphere Watch Programme. Close links to the services offered by the metrology community (European Association of National Metrology Institutes) are also important.

32. Measurements must satisfy requirements for quality assurance, quality control and data reporting. Reporting formats, as well as criteria for instrumentation and analytical methods, are also defined and provided at the Chemical Coordinating Centre website.[3] However, other methods may be used, provided that data quality can be proven to be equivalent.

33. An open data policy will apply for all data from the monitoring efforts at EMEP levels 1, 2 and 3. Data will be available to all interested users, together with information about metadata on data originator, quality assurance measures, etc., to achieve the most efficient and transparent use of observations in support of the Convention needs.

V. Implementation and further evolution of the monitoring strategy

34. All Parties are requested to ensure the full implementation of the monitoring strategy.

35. It is essential to extend the implementation of the EMEP monitoring programme throughout the ECE region, in particular in Eastern Europe, the Caucasus and Central Asia and South-Eastern Europe, starting with level 1 variables.

36. Due to the large number of parameters to be measured and the proposed site density, some Parties might, for various reasons, have different priorities or have difficulties in conducting all activities defined at level 1 and level 2. EMEP will thus accept information that does not fully satisfy the level-oriented requirements. Any major change in or deviation from the monitoring programme by any Party should be made in consultation with the Chemical Coordinating Centre. Parties with economies in transition that have not been able to operate an adequate EMEP monitoring site in the past are encouraged to enter the programme as soon as possible, if necessary, at a lower level of ambition, for example, by implementing only parts of the programme in the beginning. The Chemical Coordinating

[3] See https://ebas-submit.nilu.no/Standard-Operating-Procedures.

Centre is committed to providing guidance to the Parties on priorities with respect to which parameters to monitor.

37. The EMEP monitoring strategy must be ready to adapt to new needs and requirements identified by EMEP and the Convention. At the same time, consistent long-term time series need to be maintained to monitor trends in atmospheric composition. This requires the strategy and its implementation to be regularly reviewed and, as appropriate, revised. The Chemical Coordinating Centre will coordinate reviews and, together with the Task Force on Measurements and Modelling, the EMEP Centres and other relevant bodies, present recommendations for revisions to the EMEP Steering Body.

Appendix

Monitoring requirements for the various levels specified by the monitoring strategy

Levels 1 and 2 are mandatory. Information on reference methods is provided in the EMEP Manual for Sampling and Chemical Analysis and in the Quality assurance/Quality control section available on the EMEP Chemical Coordinating Centre website: www.emep.int; https://projects.nilu.no//ccc/index.html.

Level 1 - "variables to be measured at all basic EMEP sites"		*Recommended temporal resolution*
Inorganic compounds in precipitation	SO_4^{2-}, NO_3^-, NH_4^+, H^+ (pH), Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, precipitation amount	24 hours
Inorganic compounds in air	SO_2, SO_4^{2-}, NO_3^-, HNO_3, NH_4^+, NH_3, (sNO_3, sNH_4), HCl, Na^+, K^+, Ca_2^+, Mg_2+	24 hours
Elemental and Organic Carbon	EC and OC in $PM_{2.5}$	24 hours /7 days
Nitrogen dioxide	NO_2	1 hour/24 hours
Ozone	O_3	1 hour
PM mass concentration	$PM_{2.5}$, PM_{10}	24 hours
Heavy metals in precipitation	Cd, Pb (1st priority), Cu, Zn, As, Cr, Ni (2nd priority)	7 days
Meteorology	Precipitation amount (RR), temperature (T), wind direction (dd), wind speed (ff), relative humidity (rh), atmospheric pressure (pr)	24 hours (RR), others 1 hour

Level 2 - "additional variables to be measured at a subset of sites - EMEP level 2 sites"		*Recommended temporal resolution*
Oxidant precursors and gaseous short-lived climate pollutants		
Nitrogen oxide	NO	1 hour
Light hydrocarbons	C_2–C_5, BTEX (Benzene, Toluene, Ethylbenzene and Xylene)	1 hour/grab sample once or twice per week
OVOCs	Aldehydes and ketones	Absorbing Solution tube, once or twice per week
Hydrocarbons	C_6–C_{12}	1 hour/ABS tube, once or twice per week
Methane	CH_4	1 hour
Carbon Monoxide	CO	1 hour
Particulate matter (PM) observations contribute to the assessment of particulate matter and its source apportionment		
PM mass	PM_1	1 hour
Elemental and Organic Carbon in air	EC and OC in PM_{10}	24 hours/7 days

Level 2 - "additional variables to be measured at a subset of sites - EMEP level 2 sites"		*Recommended temporal resolution*
Mineral dust in PM_{10}	Si, Al, Fe, Ca	24 hours/7 days
Particle light absorption/equivalent black carbon	Light absorption coefficient, eBC	1 hour
Particle number concentration	dp >10nm	1 hour
Particle number size distribution	dN/dlogDp, (sub/supermicrometer)	1 hour
Particle light-scattering coefficients	Light-scattering coefficient, Light backscatter coefficients (multi-wavelengths)	1 hour
Particle chemistry speciation	Non-refractory organic and inorganic composition (ACSM, AMS)	1 hour
Aerosol Optical Depth	AOD at 550 nm	1 hour
Acidification and eutrophication observations contribute to the assessment of nitrogen chemistry, influence by local emissions and dry deposition fluxes		
Gas particle ratio of N-species	NH_3/NH_4^+, HNO_3/NO_3 - (artefact-free methods)	1 hour/24 hours
Gas particle ratios of N-species	NH_3, NH_4^+, HNO_3, NO_3- (HCl) (complementing the filter pack sampling)	1 month
Heavy metals observations contribute to the assessment of mercury and heavy metals fluxes		
Mercury in precipitation	Hg	7 days
Mercury in air	Hg (TGM)	1 hour/24 hours/7 days
Heavy metals in air	Cd, Pb (1st priority), Cu, Zn, As, Cr, Ni (2nd priority)	7 days
Persistent organic pollutants (POPs) observations contribute to the assessment of persistent organic pollutants		
POPs in precipitation	PAHs, PCBs, HCB, chlordane, HCHs, DDT/DDE	7 days
POPs in air	PAHs, PCBs, HCB, chlordane, HCHs, DDT/DDE	24 hours/7 days/24 hours or 48 hours once or twice per week (depending on sampling with respect to artefact problems)
Tracers observations contributes to the assessment of individual long-range transport events and their source apportionment		
Halocarbons	CFCs, HCFCs, HFCs, PFCs, SF_6	1 hour

Level 3 – Research-based and voluntary measurements, preferably, but not limited to, EMEP level 1/2 sites. May also include both campaign and long-term observations. Observations contribute to the understanding of processes relevant to long-range transport of air pollutants and support model development and validation		*Recommended temporal resolution*
NOy chemistry	HNO_2, NO_3, N_2O_5, PAN, organic nitrates	1 hour
Ammonia in emission areas (optional)	NH_3	1 month
Vertical profiles	O_3 soundings, aerosol LiDAR	1 hour
Organic tracers, OC fractionation	Levoglucosan, others, Water soluble and water insoluble OC (WSOC/WINSOC)	24 hours/7 days
Organic tracers	Levoglucosan, others	24 hours/7 days
Isotopic information	OC, EC, VOCs, CH_4, CO_2, Hg	24 hours/7 days
Greenhouse gases	CO_2, N_2O	1 hour
Hydrogen	H_2	1 hour
Hydroxyl radical	OH-	1 hour
Hydroperoxide	H_2O_2	1 hour
OVOC Alcohols	Methanol, Ethanol	ABS tube, once or twice per week
Major inorganics in $PM_{2.5}$ and PM_{10}	SO_4^{2-}, NO_3^-, NH_4^+, Na^+, K^+, Ca_2^+, Mg^+ (Cl^-)	7 days
Mercury speciation	RGM and TPM	1 hour/24 hours/7 days
POPs passive sampling at higher spatial resolution	For example, PAHs, PCBs, HCB, chlordane, HCHs, DDT/DDE	1 month
POPs other than those listed above, as well as organic contaminants of emerging concern	For example, PBDEs, PFAS, SCCPs	As considered appropriate
Dry deposition flux	nitrogen species, O_3, VOCs, particles, other	1 hour

Decision 2019/2

Review of compliance by Parties to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol)

The Executive Body,

Recalling its decision 2012/25 on improving the functioning of the Implementation Committee,

Recalling also its decision 2012/2 on amendment of the text of, and annexes II to IX to, the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) and the addition of new annexes X and XI, adopted on 4 May 2012,

Welcoming the entry into force of those amendments on 7 October 2019,

Acting in accordance with article 9 of the Convention,

Encouraging Parties to the original Gothenburg Protocol that have not yet accepted the amended Gothenburg Protocol to do so as soon as possible,

Emphasizing the need for Parties to the amended Gothenburg Protocol to comply with their emission reduction commitments for 2020 and beyond, as listed in annex II of the amended Protocol,

Recognizing that Parties to the original Gothenburg Protocol that have not yet accepted the amended Gothenburg Protocol remain legally obligated to meet their 2010 emission ceilings, as set out in annex II to the original Gothenburg Protocol, and that compliance reviews of those ceilings will continue for those Parties,

Noting that, for the Parties that have accepted the amended Gothenburg Protocol, emission reduction commitments for 2020 and beyond, as listed in annex II to the amended Gothenburg Protocol, will be in effect as of 1 January 2020,

Noting also that emission data that will enable the review of compliance by Parties with the emission reduction commitments for 2020 and beyond, as listed in annex II to the amended Gothenburg Protocol, will become available in 2022 and beyond,

Noting further the need for clear priorities in the interest of the most efficient use of resources,

Decides to:

1. Invite the Parties to the amended Gothenburg Protocol, from 2022, to refrain from making use of the adjustment procedure provided for in article 3, paragraph 11 quinquies of the amended Gothenburg Protocol, for the purposes of comparing national emission totals with the 2010 emission ceilings set out in table 1 of annex II to that Protocol;

2. Amend its decision 2012/25, by replacing paragraph 3 (b) of the annex with the following: “Consider any submission or referral made in accordance with paragraphs 4 and 5 below, with a view to securing a constructive solution, with the exception, from 2022 onwards, of ongoing or new submissions or referrals of possible non-compliance by a Party to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, as amended on 4 May 2012, with one of its 2010 emission ceilings set out in table 1 of annex II to that Protocol. Such submissions or referrals will no longer be considered.”

Decision 2019/3

Adoption of the code of good practice for wood-burning and small combustion installations

The Executive Body,

Recalling item 2.3.8 of the 2018–2019 workplan for the implementation of the Convention (ECE/EB.AIR/140/Add.1) adopted at its thirty-seventh session,

Recognizing the need to strengthen air pollution abatement measures for the residential and small combustion sector in order to further reduce emissions of particulate matter, including black carbon, mercury and persistent organic pollutants, in particular polycyclic aromatic hydrocarbons,

Decides to adopt the code of good practice for wood-burning and small combustion installations contained in document ECE/EB.AIR/2019/5.

Decision 2019/4

The review of the Gothenburg Protocol, as amended in 2012

The Executive Body,

Welcoming the entry into force of the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol), as amended in 2012, on 7 October 2019,

Recalling article 10 of the amended Protocol, which indicates that Parties shall keep under review the obligations set out in the present Protocol, including the adequacy of the obligations and the progress made toward the achievement of the objective of the present Protocol,

Recalling also that article 10 also calls for an evaluation of mitigation measures for black carbon emissions and ammonia control measures, no later than at the second session of the Executive Body after the entry into force of the amended Protocol,

Noting the report of the Working Group on Strategies and Review at its fifty-seventh session (Geneva, 21–24 May 2019) and the list of potential elements that could inform the scope and content of the review (ECE/EB.AIR/WG.5/122 and annex I), as well as the submissions provided by Parties and subsidiary bodies regarding elements of, and inputs to, the review of the Gothenburg Protocol,

Recalling the 2016 scientific assessment of the Convention,[4] the recommendations of the ad hoc policy review group of experts on the 2016 scientific assessment (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4) and the long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex),

1. *Decides* to initiate the review of the Gothenburg Protocol as amended in 2012;

2. *Requests* the Working Group on Strategies and Review to develop a plan for the review that includes its scope and content by continuing to elaborate elements for, and inputs to, the review on the basis of annex I to the report of the Working Group at its fifty-seventh session, taking into account the above-mentioned reports;

3. *Invites* Parties, subsidiary bodies, observers and other interested groups and organizations to submit views on additional elements to be considered in the upcoming review by 15 March 2020, to be compiled by the secretariat, and *requests* the Working Group on Strategies and Review to give due consideration to any views received in undertaking the task referred to in paragraph 2 above;

4. *Requests* the Working Group on Strategies and Review, working in collaboration with appropriate bodies of the Convention, to produce a detailed work schedule for the review, including the procedure for undertaking it, that includes a prioritization, as needed, of the elements to be considered in the review as forwarded to the Executive Body by the Working Group and contained in the annex to the present decision;

5. *Also requests* the subsidiary bodies of the Convention to prioritize work that supports the review;

6. *Further requests* that the plan and work schedule be forwarded to the Executive Body for consideration at its fortieth session (Geneva, 14–18 December 2020), with a view to concluding the review at its forty-second session, unless otherwise decided by the Executive Body.

[4] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016); and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

Annex

List of potential elements that could inform the scope and content of the review of the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone

A. Legally required elements

Article 10, including:

(a) Obligations in relation to calculated and internationally optimized allocations of emission reductions;

(b) The adequacy of the obligations and the progress made towards achievement of the objective of the present Protocol;

(c) Evaluation of the mitigation measures for black carbon emissions;

(d) Evaluation of ammonia control measures and consideration of the need to revise annex IX to the Protocol.

B. Elements in the existing Protocol

(a) Sufficiency and effectiveness of obligations with respect to acidification, eutrophication and ozone precursors, including further emission requirements to meet the objectives of the Protocol;

(b) Current flexibilities, including deadlines and timescales;

(c) Black carbon reporting;

(d) Sufficiency and effectiveness of obligations with respect to particulate matter, including further emission requirements to meet the objectives of the Protocol and strengthened measures, in particular for residential solid fuel combustion.

C. Elements meant to address gaps

(a) Appropriate steps towards reducing emissions of black carbon, ozone precursors not yet addressed, such as methane, and emissions from shipping (with due consideration for International Maritime Organization policies and measures);

(b) Further flexibilities [, for example, revised deadlines,] and new approaches [, for example, possibly considering step-wise ratification,] in order to [overcome barriers and] facilitate ratification and implementation by [Parties that have not yet ratified the Protocol, including] countries in Eastern Europe, the Caucasus and Central Asia;

(c) An integrated approach to addressing air pollution through a multi-pollutant, multi-effect approach, which includes potential interaction with climate change, the nitrogen cycle and biodiversity and can achieve multiple goals and benefits and avoid potential unintended consequences of proposed actions for other environmental problems.

D. Scientific and technical inputs

(a) Quality and consistency of inventories, and in particular black carbon emissions inventories, and condensables in particulate matter, including emissions factors;

(b) Definition of black carbon;

(c) Additional types of non-forested terrestrial ecosystems for monitoring and modelling the effects of air pollution;

(d) Update of critical loads for the analysis of the effectiveness of policies;

(e) Effects of air pollution on biodiversity as a basis for critical levels/loads calculations;

(f) Metrics for assessing ozone damages to crops and ecosystems and interactions with other pollutants and climate change;

(g) Accounting for linkages with climate change and land use in effects indicators;

(h) Analysis of costs and benefits, including costs of inaction;

(i) Further input from the Task Force on Hemispheric Transport of Air Pollution on ozone and ozone precursors and particulate matter, including in response to questions proposed by the Working Group on Strategies and Review and recommended control strategies for further modelling by the Task Force;

(j) Definition of human health impact metrics;

(k) Trend analysis in emissions/concentrations/depositions/impacts at the multi-scale dimension, and consideration of impact of international policies on trends;

(l) Ways to address barriers to implementation, including for existing sources.

Decision 2019/5

Establishment of the forum for international cooperation on air pollution

The Executive Body,

Recognizing the importance of cooperation beyond the ECE region,

Recalling the Long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020−2030 and beyond (decision 2018/5, annex),

Recalling also that it agreed at its thirty-eighth session (Geneva, 10–14 December 2018) to establish a forum for collaboration on reducing air pollution (ECE/EB.AIR/142, para. 68 (b)),

1. *Welcomes* the establishment of the Forum in line with the proposal attached to the report of the Executive Body on its thirty-ninth session (see ECE/EB.AIR/144, Annex I);

2. *Invites* the Executive Body Bureau to continue to develop the proposal for the forum;

3. *Decides* that the Executive Body Bureau will continue to lead the development of the forum during the initial phase, including the development of terms of reference, the identification of countries willing to lead the forum, the organization of an initial meeting, the continued development of the forum website, and outreach to relevant international organizations;

4. *Invites* Parties, countries and other participants of the forum to make voluntary in-kind or in-cash earmarked contributions to support the work of the forum.

Decision 2019/6

Revised mandate of the Task Force on Emission Inventories and Projections

The Executive Body,

Recalling its decision on the establishment of the Task Force on Emission Inventories (ECE/EB.AIR/29, para. 34 (d)),

Acknowledging the recent achievements of the Task Force on Emission Inventories and Projections, which include:

(a) Major revisions of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)/European Environment Agency Air Pollutant Emission Inventory Guidebook (EMEP/European Environment Agency Guidebook)[5] used for the estimation and reporting of national emissions (published in 2016);

(b) Holding regular meetings of the Task Force expert network to harmonize emission factors, establish methodologies for the evaluation of emission data and projections and identify problems related to emissions reporting; supporting initiatives to continually improve the quality of emission inventory data, such as the annual emission inventory review process;

(c) Improving cooperation and collaborative working with stakeholder groups within the Convention, to ensure that the outputs from the Task Force expert network continue to better meet users' needs;

(d) Supporting the implementation of the reporting requirements specified in the Convention's emission reporting guidelines, including providing expert guidance to the Executive Body and the Implementation Committee on the adjustment application and review procedures established under the 2012 amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol).

Recognizing the need to update the mandate of the Task Force to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[6]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Welcoming the ongoing leadership of the Task Force by Finland, the United Kingdom of Great Britain and Northern Ireland and the European Union,

1. *Adopts* the revised mandate of the Task Force as contained in the annex to the present decision, which includes the key objectives and functions of the Task Force to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The lead country or countries have the responsibility for leading and coordinating the ongoing work and tasks of the Task Force, for organizing its meetings, for

[5] See https://www.eea.europa.eu/publications/emep-eea-guidebook-2016

[6] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

communicating with participating experts, for maintaining an up-to-date web page that includes information on the activities, work, meetings and participants of the Task Force, and for other organizational arrangements in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(b) The Task Force is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work;

(c) The Task Force will be comprised of subject matter experts from the Parties to the Convention, acting in their personal capacity;

(d) Meetings will be open to representatives of intergovernmental or accredited non-governmental organizations, researchers, industry associations and other relevant organizations. Co-Chairs are encouraged to invite individuals with expertise relevant to the work of the Task Force. Meeting reports will reflect the views of all participants to the extent practicable;

(e) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. In that event, the withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for the operations of the Task Force are provided to the appropriate country or person(s).

Annex

Revised mandate of the Task Force on Emission Inventories and Projections

1. The Task Force on Emission Inventories and Projections will continue to assist EMEP by providing sound scientific support to the Convention and its Parties concerning the reporting of air pollutant emissions and projections data.

2. The Task Force will report on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Task Force are to:

(a) Develop further the EMEP/European Environment Agency Guidebook methodologies by supporting work that provides updated information from literature and by liaising with other projects; ensure regular updating of the maintenance and improvement plan for the EMEP/European Environment Agency Guidebook, with a view to publishing major updates every three to four years;

(b) Maintain and coordinate the activities of an expert network on emissions inventories and projections, to facilitate technical discussions between experts on a range of different topics related to air pollutant emissions;

(c) Hold regular meetings of the Task Force and its expert panels, to provide a technical forum for the expert network to share best practice and exchange information on national and international activities on emission inventories and projections. This includes initiatives to: harmonize emission factors; establish methodologies for the evaluation of emission data and projections; and identify problems related to emissions reporting and recommended solutions;

(d) Support Parties in implementing the reporting requirements of the Convention's emission reporting guidelines. This includes supporting: initiatives to improve the quality of emission inventory data, such as the annual emission inventory review process; and the adjustment application and review procedures established under the amended Gothenburg Protocol through the provision of expert guidance;

(e) Undertake specific activities and initiatives within the emissions inventory technical area, including:

(i) Updating the guidance for adjustments under the Gothenburg Protocol, if required, with comments provided by Parties and as instructed by the Executive Body;

(ii) Reviewing the need to update the methods and procedures for emission inventory reviews and ensuring continued alignment with activities under the United Nations Framework Convention on Climate Change.

(f) Support the Convention's capacity-building activities in countries in Eastern Europe, the Caucasus and Central Asia, as resources allow. This includes holding specific meetings with experts from these regions at meetings of the Task Force and contributing to in-country capacity-building and training activities;

(g) Cooperate closely with other partners within the Convention, in particular, the EMEP centres and task forces, the Task Force on Reactive Nitrogen and the Task Force on Techno-economic Issues through, among other things, joint workshops and contributions to joint activities;

(h) Collaborate with external partners, – such as the Arctic Monitoring and Assessment Programme, the Stockholm Convention on Persistent Organic Pollutants, the United Nations Framework Convention on Climate Change and the Minamata Convention on Mercury – on specific technical issues, as necessary;

(i) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/7

Revised mandate of the Task Force on Integrated Assessment Modelling

The Executive Body,

Recalling its decision at its fourth session (Geneva, 11–14 November 1986), whereby it established the Task Force on Integrated Assessment Modelling (ECE/EB.AIR/10, annex III, para. 5 (2)),

Acknowledging the recent achievements of the Task Force on Integrated Assessment Modelling, which include:

(a) Analysis of the initial impact of the 2012 amended Gothenburg Protocol, which sets new emission ceilings objectives with respect to air pollutants, including fine particulate matter;

(b) Demonstration of the benefits of developing synergies between environmental policies, in particular climate and air pollution policies;

(c) Assessment of the impact of short-lived climate pollutants on air pollution inside and outside the ECE region and conception and evaluation of mitigation options to target those pollutants;

(d) Analysis of the linkages between global, regional and local air pollution patterns and levels in the ECE region, and evaluation of potential synergies between control measures that could be implemented at various geographical scales.

Recognizing the need to update the mandate of the Task Force to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[7]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Welcoming the ongoing leadership of the Task Force by the Netherlands and Sweden,

1. *Adopts* the revised mandate of the Task Force as contained in the annex to the present decision, which includes the key objectives and functions of the Task Force to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The lead country or countries have the responsibility for leading and coordinating the ongoing work and tasks of the Task Force, for organizing its meetings, for communicating with participating experts, for maintaining an up-to-date web page that includes information on the activities, work, meetings and participants of the Task Force, and for other organizational arrangements in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(b) The Task Force is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work;

[7] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(c) The Task Force will be comprised of subject matter experts from the Parties to the Convention, acting in their personal capacity;

(d) Meetings will be open to representatives of intergovernmental or accredited non-governmental organizations, researchers, industry associations and other relevant organizations. Co-Chairs are encouraged to invite individuals with expertise relevant to the work of the Task Force. Meeting reports will reflect the views of all participants to the extent practicable;

(e) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. In that event, the withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for the operations of the Task Force are provided to the appropriate country or person(s).

Annex

Revised mandate of the Task Force on Integrated Assessment Modelling

1. The Task Force on Integrated Assessment Modelling will continue to guide the work of the Centre for Integrated Assessment Modelling, review its modelling results and exchange modelling experiences of the Parties. The Centre and the Task Force will continue to integrate information from the other scientific bodies under EMEP and the Working Group on Effects and assess future scenarios and the cost-effectiveness of abatement strategies, as requested by the Working Group on Strategies and Review. This includes multiscale multi-objective assessment modelling aimed at cost-effective policy strategies that combine international, national and local actions, as well as the links between air quality policy and other policy processes, such as the implementation of the Sustainable Development Goals.

2. The Task Force will report on its activities and deliverables to the Steering Body to EMEP, the Working Group on Effects, the Working Group on Strategies and Review and, as needed, to the Executive Body.

3. The functions of the Task Force are to:

(a) Guide the technical work of the Centre for Integrated Assessment Modelling; review the scientific quality of the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model; and assess future scenarios and the cost-effectiveness of abatement strategies upon request by the EMEP Steering Body or the Executive Body;

(b) Integrate information from the other scientific bodies under EMEP and the Working Group on Effects into the GAINS model and organize ex post analyses by these scientific bodies, as well as extend the scientific network to include data and scenario results of climate, energy, transport and agricultural models and feed data into economic models;

(c) Exchange integrated assessment modelling experiences between the Parties and organize bilateral consultations on the data used in the GAINS model; reach out to exchange experiences with countries outside the Convention area and exchange experiences with local air quality managers;

(d) Assist Parties seeking advice on developing scenarios and integrated assessment modelling to find relevant experts from other Parties;

(e) Provide expertise in support of the Parties in Eastern Europe, the Caucasus and Central Asia, and develop specific studies for these countries that require considerable resources to consolidate appropriate input data for integrated assessment modelling;

(f) Closely collaborate with:

(i) The Task Force on Emission Inventories and Projections and the Centre on Emission Inventories and Projections to improve emission estimates and projections;

(ii) The Meteorological Synthesizing Centre-West and the Task Force on Measurements and Modelling to use the latest version of the EMEP model for

source-receptor relationships and the development of a methodology to assess local exposure;

(iii) The Joint Task Force on the Health Aspects of Air Pollution and the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends to use the latest findings on exposure response relationships and impacts on biodiversity;

(iv) The Task Force on Hemispheric Transport of Air Pollution to assess cost-effective abatement strategies at the hemispheric scale.

(g) Exchange information with the Arctic Monitoring and Assessment Programme, the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, the Organization for Economic Cooperation and Development, the United Nations Environment Programme, the World Health Organization and the World Bank Group to encourage cost-effective strategies for health and ecosystems at a global scale;

(h) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/8

Revised mandate of the Task Force on Measurements and Modelling

The Executive Body,

Recalling its decision 1999/2 concerning the structure and organization of work, whereby it established the Task Force on Measurements and Modelling (ECE/EB.AIR/68, annex III),

Acknowledging the support provided by the Task Force on Measurements and Modelling to Parties to the Convention, among other things, through the following actions:

(a) Continuously discussing and fostering the development of an observational network and modelling tools essential for the verification of the impact of the actions taken on pollutants emission reduction;

(b) Actively participating in the discussions on and the elaboration, revisions and implementation of the EMEP monitoring strategy in cooperation with the Chemical Coordinating Centre;

(c) Contributing to the improvement of the scientific understanding of the processes that control European air pollution levels through regular intensive measurement campaigns;

(d) Coordinating the benchmarking of EMEP modelling tools by means of model comparison projects and focused case studies, in particular by liaising with the Meteorological Synthesizing Centre-East and the Meteorological Synthesizing Centre-West;

(e) Supporting the sharing, use and evaluation of EMEP models as tools for the assessment of air pollution transport and deposition at the national and regional levels by the Parties;

(f) Performing and publishing assessment reports and trend analyses of air pollution concentrations and deposition in the EMEP domain over the past 40 years.

Recognizing the need to update the mandate of the Task Force to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[8]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Welcoming the ongoing leadership of the Task Force by France and the World Meteorological Organization,

1. *Adopts* the revised mandate of the Task Force as contained in the annex to the present decision, which includes the key objectives and functions of the Task Force to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The lead country or countries have the responsibility for leading and coordinating the ongoing work and tasks of the Task Force, for organizing its meetings, for communicating with participating experts, for maintaining an up-to-date web page that

[8] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

includes information on the activities, work, meetings and participants of the Task Force, and for other organizational arrangements in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these responsibilities;

(b) The Task Force is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work;

(c) The Task Force will be comprised of subject matter experts from the Parties to the Convention, acting in their personal capacity;

(d) Meetings will be open to representatives of intergovernmental or accredited non-governmental organizations, researchers, industry associations and other relevant organizations. Co-Chairs are encouraged to invite individuals with expertise relevant to the work of the Task Force. Meeting reports will reflect the views of all participants to the extent practicable;

(e) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. In that event, the withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for the operations of the Task Force are provided to the appropriate country or person(s).

Annex

Revised mandate of the Task Force on Measurements and Modelling

1. The Task Force on Measurements and Modelling, in view of up-to-date scientific knowledge and technical developments within the Parties to the Convention and worldwide, will continue to examine the needs and requirements of the Parties to the Convention with the aim of supporting the improvement of tools and good practices for monitoring the state of air pollution and modelling past and future changes of concentrations of air pollutants, transboundary fluxes and deposition within the EMEP region.

2. The Task Force will report on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Task Force are to:

(a) Provide a forum for the Parties to share knowledge, experiences, views and suggestions and develop recommendations on issues related to air quality, efficiency and sufficiency of EMEP measurements and modelling;

(b) Provide an opportunity for national experts and EMEP centres to discuss performance of measurements and models (EMEP models and those developed by Parties), and their improvement, bearing in mind the scope and range of their application (such as for national assessments of air quality, assessment of transboundary fluxes and their influence on air quality and trend analyses);

(c) Plan and conduct its technical work towards implementation of the EMEP Monitoring Strategy, including provision of support to Parties' national experts, taking into consideration the challenges encountered at the national level, best practices available and recommendations provided by the EMEP Manual for Sampling and Chemical Analysis;[9]

(d) Interpret and assess observations and modelling results related to air pollution levels, assess its temporal and spatial trends and contribute to the evaluation of the effectiveness of the implementation of the Convention and its Protocols;

[9] https://projects.nilu.no//ccc/manual/index.html.

(e) Ensure the coordinated efforts of Parties in the organization and conduct of the intensive measurement periods and focused case studies, following data processing, model interpretation and results dissemination;

(f) Provide support for and facilitate involvement of Parties in Eastern Europe, the Caucasus and Central Asia, for example, with regard to setting up monitoring stations and national programmes, case studies, use of models and promoting tools developed under EMEP during workshops and other dedicated meetings;

(g) Collaborate with EMEP centres and task forces and the Working Group on Effects to evaluate emission inventories, improve modelling tools to serve the integrated modelling and effects assessment and ensure consistency between regional and hemispheric scale analyses;

(h) Strengthen linkages with European Union scientific programmes and infrastructures (for example, the Copernicus Atmosphere Monitoring Service and the European Research Infrastructure for the observation of Aerosol, Clouds and Trace Gases) with a focus on the development of common tools and regional assessments; develop joint activities with European and international organizations and conventions (for example, the European Environment Agency, the Joint Research Centre of the European Commission and the World Meteorological Organization) to ensure synergies between regional and global scales, strengthening national activities;

(i) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/9

Revised mandate of the Task Force on Hemispheric Transport of Air Pollution

The Executive Body,

Recalling its decision 2004/4 on the establishment of the Task Force on the Hemispheric Transport of Air Pollution and its decision 2010/1 on the revised mandate for the Task Force on the Hemispheric Transport of Air Pollution,

Acknowledging key accomplishments of the Task Force on the Hemispheric Transport of Air Pollution that include:

(a) Analysis of the responses, in terms of ozone and particulate matter concentrations, to a large set of emission reduction scenarios applied in large regions of the Northern hemisphere;

(b) Fostering the development of global models and their evaluation against a set of observations gathered from several networks implemented in the world and building up partnership with those networks;

(c) Assessment of synergies between regional and global modelling for integrated assessment modelling and policy support purposes;

(d) Assessment of the impact of short-lived climate pollutants on air pollution inside and outside the ECE region and conception and evaluation of mitigation options to target those pollutants.

Recognizing the need to update the mandate of the Task Force on the Hemispheric Transport of Air Pollution to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[10]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Welcoming the ongoing leadership of the Task Force by Canada and the United States of America,

1. *Adopts* the revised mandate of the Task Force as contained in the annex to the present decision, which includes the key objectives and functions of the Task Force to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The lead country or countries have the responsibility for leading and coordinating the ongoing work and tasks of the Task Force, for organizing its meetings, for communicating with participating experts, for maintaining an up-to-date web page that includes information on the activities, work, meetings and participants of the Task Force, and for other organizational arrangements in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these responsibilities;

[10] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(b) The Task Force is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work;

(c) The Task Force will be comprised of subject matter experts from the Parties to the Convention, acting in their personal capacity;

(d) Meetings will be open to representatives of intergovernmental or accredited non-governmental organizations, researchers, industry associations and other relevant organizations. Co-Chairs are encouraged to invite individuals with expertise relevant to the work of the Task Force. Meeting reports will reflect the views of all participants to the extent practicable;

(e) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. In that event, the withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for the operations of the Task Force are provided to the appropriate country or person(s).

Annex

Revised mandate for the Task Force on Hemispheric Transport of Air Pollution

1. The Task Force on Hemispheric Transport of Air Pollution will continue to examine the transport of air pollution across the Northern hemisphere and its regional impacts, considering air quality, health, ecosystem and near-term climate effects.

2. The Task Force will report on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Task Force are to:

(a) Plan and conduct the technical work necessary to develop a fuller understanding of:

(i) The impact of air pollutant emissions from the Parties on human health, ecosystems and climate change outside the ECE (i.e. extraregional impacts);

(ii) The impact of air pollutant emissions sources outside the ECE on the achievement of the environmental objectives of the Convention and its Protocols (i.e. extraregional influences);

(iii) The impacts of emission-reduction opportunities in the ECE region on regional and intercontinental transport of air pollution and the associated air quality, health, ecosystem and near-term climate effects of such impacts and the impacts of complementary measures that might be taken in other regions where mitigation may prove cost-effective.

(b) Conduct the work specified in paragraph 3 (a) above as it pertains to all of the pollutants and precursors addressed by the Convention, particularly those with important transboundary influence at the global level, including persistent organic pollutants and mercury, with priority given to tropospheric ozone and aerosols;

(c) Conduct the technical work identified above through coordination, cooperation and collaboration with:

(i) Other technical bodies under the Convention, including the Task Force on Measurements and Modelling, the Task Force on Emission Inventories and Projections, the Task Force on Integrated Assessment Modelling, the Task Force on Techno-economic Issues and the international cooperative programmes of the Working Group on Effects;

(ii) Related international organizations and scientific efforts, including the Arctic Council, the Arctic Monitoring and Assessment Programme, the United Nations

Environment Programme, the World Meteorological Organization, the World Health Organization, the Intergovernmental Panel on Climate Change, the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury and other regional agreements and networks.

(d) Facilitate the dissemination of knowledge and methodologies developed within the Convention to other regions of the world, through cooperation with bodies inside and outside the Convention, to help build a common understanding of shared air pollution problems and improve technical capacity to evaluate emission reduction opportunities;

(e) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/10

Revised mandate for the Chemical Coordinating Centre

The Executive Body,

Recalling the provisions of article 9 and other relevant provisions of the Convention on Long-range Transboundary Air Pollution,

Recalling also the provisions of the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol),

Noting that the Chemical Coordinating Centre has been in operation since 1979 – the beginning of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) – as one of the three cooperating international centres of EMEP,

Recalling the terms of reference for the international EMEP centres (EB.AIR/GE.1/8, annex IV), adopted at its fourth session (ECE/EB.AIR/10),

Recognizing the Centre's contribution to the scientific assessment of past trends and current status in air pollution throughout the United Nations Economic Commission for Europe (ECE) region and to the evaluation of the implementation of the Protocols to the Convention,

Acknowledging the support provided by the Chemical Coordinating Centre to the Parties to the Convention and EMEP, among other things, through the following actions:

(a) Development and updating of the EMEP monitoring strategy (including quality assurance framework) and support to Parties in its implementation to ensure availability of high-quality comparable data on air pollution throughout the ECE region;

(b) Promotion and dissemination of best practices available and recommendations for implementation of the EMEP monitoring strategy, in particular through the provision of the EMEP Manual for Sampling and Chemical Analysis;[11]

(c) Contribution to the improvement of the scientific understanding of the processes that control European air pollution levels through regular intensive measurement campaigns;

(d) Contribution to the elaboration of assessment reports and trend analyses of air pollution concentrations and deposition in the EMEP domain over the past 40 years;

(e) Development and maintenance of the database hosting observation data of atmospheric chemical composition and physical properties (EBAS), which collects, gathers, checks and publishes all observations and measurements performed by the Parties to the Convention;

(f) Support and assistance to Parties for running new observation sites, especially in Eastern Europe, the Caucasus and Central Asia.

Recognizing the need to update the mandate of the Chemical Coordinating Centre to ensure its consistency with the provisions of the amended Protocols to the Convention, and to take into account its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[12]

[11] See https://projects.nilu.no//ccc/manual/index.html.

[12] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016); and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting that the annual costs of the centres cooperating within EMEP for the activities appearing in the work programme of the Steering Body of EMEP are covered in accordance with the EMEP Protocol, from contributions by the Parties to the Convention on the basis of the annual EMEP budget approved by the Executive Body upon the recommendation of the Steering Body to EMEP:

1. *Notes with appreciation* the hosting of the Chemical Coordinating Centre by the Norwegian Institute for Air Research;

2. *Adopts* the revised mandate of the Chemical Coordinating Centre as contained in the annex to the present decision, which includes the key objectives and functions of the Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

3. *Decides* that the Centre is responsible for communicating with national experts, for maintaining an up-to-date web page that includes information on its work and for other organizational arrangements in accordance with the biennial workplan;

4. *Decides* that the Centre is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Chemical Coordinating Centre

1. The Chemical Coordinating Centre will continue to provide scientific support to the Convention, with information on measurements of all pollutants and precursors addressed by the Convention.

2. The Chemical Coordinating Centre reports on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Centre are to:

(a) Develop and coordinate the observation activities required to assess air pollution across the EMEP geographical domain;

(b) Secure and improve the quality and representativeness of observations:

(i) Develop adequate methodology to support EMEP needs where not available elsewhere, and ensure harmonization with the European Committee for Standardization, the International Organization for Standardization, the metrology community, etc.;

(ii) Develop and update measurement guidelines and standard operation procedures in cooperation with the Task Force on Measurements and Modelling, the central quality assurance facilities in the European Union (for example, the Network of Air Quality Reference Laboratories, the European Committee for Standardization and the European Research Infrastructure for the observation of Aerosol, Clouds and Trace Gases) and the World Meteorological Organization (WMO) Global Atmosphere Watch Programme;

(iii) Organize training courses and undertake site visits (selection of new sites, audits) and laboratory audits;

(iv) Arrange regular laboratory intercomparisons for all variables required by the EMEP monitoring strategy, and link results to data usage and interpretation;

(v) Arrange field intercomparisons and assess the representativeness of observations.

(c) Carry out quality assurance and quality control of data submitted by Parties, including by:

(i) Developing data-reporting templates allowing sufficient metadata provision;

(ii) Providing training and assistance to personnel involved in data reporting;

(iii) Carrying out technical handling of data flow; checking of individual data sets submitted, including statistical methods; visual inspection of time series plots, consistency in time and space; and bilateral discussions on corrections and re-submissions with data originators.

(d) Archive observation data and associated metadata and disseminate them to users,[13] including provision of development and operational support of the underlying information technology-infrastructure used to host data and provision of access to data for operational users (other EMEP centres, external modelling groups and external users (for example, the European Environment Agency, the WMO/Global Atmosphere Watch Programme and the Copernicus Atmosphere Monitoring Service));

(e) Improve the timeliness of observation data to users (EMEP Near-Real-Time);

(f) Assess data and provide information to stakeholders on results from monitoring activities;

(g) Support Parties, EMEP centres and others in data assessments and interpretations; provide expert advice on the use of data, taking into account knowledge about data quality and other metadata; prepare data reports providing status of observations and main findings;

(h) Contribute to the EMEP status reports prepared for the EMEP Steering Body; serve the interests of EMEP monitoring activities towards relevant activities under other frameworks to ensure harmonization, efficient use of resources and multiple use of data; promote the use of EMEP observations in supporting European scale assessment of air pollution and source apportionment with respect to monitoring required in response to the European Union directives; maintain links with external bodies addressing similar issues within Europe (the European Environment Agency, the Baltic Marine Environment Protection Commission, the Commission for the Protection of the Marine Environment of the North-East Atlantic, among others); maintain links with external bodies addressing similar issues outside Europe (Arctic Monitoring and Assessment Programme, World Meteorological Organization Global Atmosphere Watch Programme, Stockholm Convention on Persistent Organic Pollutants, Minamata Convention on Mercury, regional programmes in North America, South-East Asia and elsewhere (in collaboration with the Task Force on Hemispheric Transport of Air Pollution)); promote EMEP observations as a contribution to the Copernicus Atmosphere Monitoring Service and the Global Earth Observation System of Systems; and encourage the involvement of research groups to ensure implementation of EMEP level 2 and level 3 monitoring activities;

(i) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

[13] See http://ebas.nilu.no.

Decision 2019/11

Revised mandate for the Meteorological Synthesizing Centre-East

The Executive Body,

Recalling the provisions of article 9 and other relevant provisions of the Convention on Long-range Transboundary Air Pollution,

Recalling also the provisions of the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol),

Noting that the Meteorological Synthesizing Centre-East has been in operation since 1979 – the beginning of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) – as one of the three cooperating international centres of EMEP,

Recalling the terms of reference for the international EMEP centres (EB.AIR/GE.1/8, annex IV), adopted at its fourth session (ECE/EB.AIR/10),

Recognizing the Centre's contribution to the scientific assessment of past trends and current status in air pollution throughout the United Nations Economic Commission for Europe (ECE) region and to the evaluation of the implementation of the Protocols to the Convention,

Acknowledging the support provided by the Meteorological Synthesizing Centre-East to the Parties to the Convention and EMEP, among other things, through the following actions:

(a) Continuously maintaining and promoting the development of modelling tools essential for the verification of the impact of the actions taken on pollutants emission reduction in the ECE region, in particular for heavy metals and persistent organic pollutants (POPs);

(b) Extending the EMEP model to the global scale to support assessment of the impact of heavy metals and POPs in the Northern hemisphere;

(c) Contributing to the evaluation and improvement of emission data reported by the Parties and supporting the Centre on Emission Inventories and Projections in gap-filling for heavy metals and POPs emissions that are not correctly documented;

(d) Contribution to the elaboration of assessment reports and trend analyses of air pollution concentrations and deposition in the EMEP domain over the past 40 years;

(e) Conducting several pilot studies with national experts to investigate the reasons for discrepancies between emissions, measurements and modelling results in some countries;

(f) Supporting the sharing, use and evaluation of EMEP models as tools for the assessment of air pollution transport and deposition at the national and regional levels by the Parties.

Recognizing the need to update the mandate of the Meteorological Synthesizing Centre-East to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[14]

[14] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting that the annual costs of the centres cooperating within EMEP for the activities appearing in the work programme of the Steering Body of EMEP are covered in accordance with the EMEP Protocol, from contributions by the Parties to the Convention on the basis of the annual EMEP budget approved by the Executive Body upon the recommendation of the Steering Body to EMEP:

1. *Notes with appreciation* the hosting of the Meteorological Synthesizing Centre-East by the Russian Federation;

2. *Adopts* the revised mandate of the Meteorological Synthesizing Centre-East as contained in the annex to the present decision, which includes the key objectives and functions of the Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

3. *Decides* that the Centre is responsible for communicating with national experts, for maintaining an up-to-date web page that includes information on its work, and for other organizational arrangements in accordance with the biennial workplan;

4. *Decides* that the Centre is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Meteorological Synthesizing Centre-East

1. The Meteorological Synthesizing Centre-East will continue to provide scientific support to the Convention with information on modelling of heavy metals (lead (Pb), cadmium (Cd) and mercury (Hg)) and persistent organic pollutants (POPs, including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) and hexachlorobenzene (HCB)).

2. The Centre reports on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Centre are to:

(a) Prepare data on anthropogenic emissions of heavy metals and POPs on the regional (EMEP domain) and global scales, including auxiliary parameters (for example, emission height, temporal variation and chemical composition) as input for operational modelling based on gridded emission data sets provided by Centre for Emission Inventories and Projections and expert estimates;

(b) Prepare input data required for modelling of heavy metals and POPs on the regional and global scales, including wind suspension of mineral dust and atmospheric concentrations of chemical reactants and particulate matter;

(c) Collect and process measurement data for evaluation of model performance from various monitoring networks and databases (for example, EBAS, AirBase, Global Mercury Observation System and United Nations Environment Programme Stockholm Convention Global Monitoring Plan Data Warehouse);

(d) Update the modelling tools with new findings and improved parameterizations developed by the Centre in its research activities in accordance with the biennial workplan and in cooperation with the scientific community;

(e) Perform simulations of heavy metals and POPs dispersion on a global scale for evaluation of intercontinental transport of Hg and POPs and its impact on pollution levels in the EMEP countries;

(f) Perform further testing and evaluation of model performance in simulations of air concentration and deposition levels, as well as source-receptor relationships of heavy metals and POPs on the new EMEP grid;

(g) Perform operational model assessment of heavy metal (Pb, Cd and Hg) and POP (PAHs, PCBs, PCDD/Fs and HCB) pollution levels over the EMEP domain;

(h) Perform quality assurance and quality control of modelling results through evaluation against measurements from the EMEP and other monitoring networks;

(i) Provide support to Parties to the Convention in using the model assessment results and access to the modelling tools, and, in particular, present and discuss results of national scale case studies and other research activities on heavy metal and POP pollution with fine resolution;

(j) Prepare annual status reports and individual country reports for the EMEP countries and make results of model calculations available online at the Meteorological Synthesizing Centre-East website; develop and maintain a website in Russian to facilitate access to information by countries in Eastern Europe, the Caucasus and Central Asia;

(k) Continue collaboration with the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops on the evaluation of heavy metal pollution levels in Europe using modelling results and measurements in mosses and develop cooperation with other International Cooperative Programmes; provide support to the Coordination Centre for Effects with information on ecosystem-specific deposition heavy metals and POPs for assessment of critical load exceedances; contribute to the Task Force on Health with information on toxic substances (PAHs, PCDD/Fs and others);

(l) Cooperate on dissemination of information and data exchange with international bodies, including the United Nations Environment Programme, the Arctic Monitoring and Assessment Programme, the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury and the Baltic Marine Environment Protection Commission;

(m) Report on its activities and deliverables to the Steering Body to EMEP and the Working Group on Effects and participate in annual meetings of the relevant task forces (Task Force on Measurements and Modelling, Task Force on Hemispheric Transport of Air Pollution);

(n) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/12

Revised mandate for the Meteorological Synthesizing Centre-West

The Executive Body,

Recalling the provisions of article 9 and other relevant provisions of the Convention on Long-range Transboundary Air Pollution,

Recalling also the provisions of the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol),

Noting that the Meteorological Synthesizing Centre-West has been in operation since 1979 – the beginning of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) – as one of the three cooperating international centres of EMEP,

Recalling the terms of reference for the international EMEP centres (EB.AIR/GE.1/8, annex IV), adopted at its fourth session (ECE/EB.AIR/10),

Recognizing the Centre's contribution to the scientific assessment of past trends and current status in air pollution throughout the United Nations Economic Commission for Europe (ECE) region and to the evaluation of the implementation of the Protocols to the Convention,

Acknowledging the support provided by the Meteorological Synthesizing Centre-West to the Parties to the Convention and EMEP, among other things, through the following actions:

(a) Continuously maintaining and promoting the development of modelling tools essential for the verification of the impact of the actions taken on pollutants emission reduction and the assessment of transboundary air pollution fluxes in the ECE region;

(b) Providing the Centre for Integrated Assessment Modelling with source/receptor matrices computed annually to feed the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model;

(c) Extending the EMEP model to the global scale to support assessment of source/receptor relationships between regions in the Northern hemisphere;

(d) Contributing to the evaluation of emission data reported by the Parties, implementing gridded emission inventories in the EMEP model and evaluating its performances against observations;

(e) Contributing to the elaboration of assessment reports and trend analyses of air pollution concentrations and deposition in the EMEP domain over the past 40 years;

(f) Investigating methodologies to build up linkages between regional and local air pollution patterns;

(g) Supporting the sharing, use and evaluation of EMEP models as tools for the assessment of air pollution transport and deposition at the national and regional levels by the Parties.

Recognizing the need to update the mandate of the Meteorological Synthesizing Centre-West to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[15]

[15] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016*

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting that the annual costs of the centres cooperating within EMEP for the activities appearing in the work programme of the Steering Body of EMEP are covered in accordance with the EMEP Protocol, from contributions by the Parties to the Convention on the basis of the annual EMEP budget approved by the Executive Body upon the recommendation of the Steering Body to EMEP:

1. *Notes with appreciation* the hosting of the Meteorological Synthesizing Centre-West by the Norwegian Meteorological Institute;

2. *Adopts* the revised mandate of the Meteorological Synthesizing Centre-West as contained in the annex to the present decision, which includes the key objectives and functions of the Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

3. *Decides* that the Centre is responsible for communicating with national experts, for maintaining an up-to-date web page that includes information on its work, and for other organizational arrangements in accordance with the biennial workplan;

4. *Decides* that the Centre is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Meteorological Synthesizing Centre-West

1. The Meteorological Synthesizing Centre-West will continue to provide scientific support to the Convention on atmospheric modelling of photochemical compounds, sulphur, nitrogen and particulate matter.

2. The Centre reports on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Centre are to:

(a) Perform model simulations to trace progress towards the emission controls under existing Protocols and support the design of new or revised Protocols, when necessary;

(b) Provide: annual assessment of transboundary air pollution fluxes inside the EMEP area; and source-receptor matrices, air concentrations and deposition fields for the EMEP domain for photochemical compounds, sulphur, nitrogen and particulate matter for the most recent year where emissions are available. Update historic model runs when necessary to keep consistency with previous years;

(c) Maintain the EMEP/Meteorological Synthesizing Centre-West model as "state-of-the-art". Evaluate results of the EMEP/Meteorological Synthesizing Centre-West model using EMEP data, as well as measurement data from other networks and projects; Improve methodologies (including multiscale modelling) and understanding of processes, parametrizations, emissions and linkages to climate and vegetation impacts;

(d) Facilitate the use of the EMEP/Meteorological Synthesizing Centre-West model by Parties, for example, by maintaining an updated open source code on the web and providing training courses for EMEP/Meteorological Synthesizing Centre-West model users;

(e) Provide annual country reports with model products and web access to model results, including data on high temporal resolution and source-receptor matrices, for use in air quality assessment by Parties;

(f) Provide support and facilitate involvement of Parties in Eastern Europe, the Caucasus and Central Asia, for example, by providing country reports in Russian, target

(Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

country participation in EMEP/ Meteorological Synthesizing Centre-West model training courses, provide support on the use of EMEP data and tools;

(g) Collaborate with EMEP centres and task forces and the Working Group on Effects on: (i) interpretation, evaluation and assessment of measured and modelled air pollution, including intercontinental transport; (ii) evaluation and improvement of emission inventories; (iii) use of EMEP/Meteorological Synthesizing Centre-West model results in integrated assessment; and (iv) risk of air pollution damage to vegetation and health;

(h) Continue cooperation with the Baltic Marine Environment Protection Commission and the Commission for the Protection of the Marine Environment of the North-East Atlantic on nitrogen deposition to sea areas, with a specific focus on shipping emissions; explore options for cooperation between EMEP and European Union programmes such as the Copernicus Atmosphere Monitoring Services, focusing on regional assessments. Support Arctic Monitoring and Assessment Programme in modelling of short-lived climate pollutant impacts; collaborate with the Aerosol Comparisons between Observations and Models and the Aerosol Chemistry Model Intercomparison Project within phase 6 of the Coupled Model Intercomparison Project on the climate impacts of short-lived climate pollutants;

(i) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/13

Revised mandate for the Centre for Integrated Assessment Modelling

The Executive Body,

Recalling the provisions of article 9 and other relevant provisions of the Convention on Long-range Transboundary Air Pollution,

Recalling also the provisions of the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol),

Recalling further its decision 1999/2 concerning the structure and organization of work, whereby it established the Centre for Integrated Assessment Modelling (ECE/EB.AIR/68, annex III),

Noting that the Centre for Integrated Assessment Modelling has been providing scientific support in the development of cost-effective emission control strategies and Protocols under the Convention,

Recognizing the Centre's contribution to the scientific assessment of past trends and current status in air pollution throughout the United Nations Economic Commission for Europe (ECE) region and to the evaluation of the implementation of the Protocols to the Convention,

Acknowledging the support provided by the Centre for Integrated Assessment Modelling to the Parties to the Convention and EMEP, among other things, through the following actions:

(a) Contributing to the improvement of the scientific understanding of the processes that control European air pollution levels through the development and regular updating of the Greenhouse Gas Air Pollution Interactions and Synergies (GAINS) model – a modelling tool for advanced integrated assessment of climate change and air pollution;

(b) Contributing to the elaboration of assessment reports and trend analyses of air pollution concentrations and deposition in the EMEP domain over the past 40 years;

(c) Incorporating the results of the Meteorological Synthesizing Centre-West atmospheric dispersion model and the latest information on critical loads and ozone fluxes into the GAINS model;

(d) Cooperating with the Task Force on Health to maintain the health impact assessment in the GAINS model in line with latest scientific findings;

(e) Conducting analyses of the likely future health and ecosystems impacts resulting from the current trends in energy use, agricultural activities and industrial production, considering the effects of the already agreed emission control measures;

(f) Exploring the cost-effectiveness of further emission controls, in view of their impacts on human health and ecosystems.

Recognizing the need to update the mandate of the Centre for Integrated Assessment Modelling to ensure its consistency with the provisions of the amended Protocols to the Convention, and to take into account the findings and strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[16]

[16] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting that the annual costs of the centres cooperating within EMEP for the activities appearing in the work programme of the Steering Body of EMEP are covered in accordance with the EMEP Protocol, from contributions by the Parties to the Convention on the basis of the annual EMEP budget approved by the Executive Body upon the recommendation of the Steering Body to EMEP:

1. *Notes with appreciation* the hosting of the Centre for Integrated Assessment Modelling by the International Institute for Applied Systems Analysis,

2. *Adopts* the revised mandate of the Centre for Integrated Assessment Modelling as contained in the annex to the present decision, which includes the key objectives and functions of the Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

3. *Decides* that the Centre is responsible for communicating with national experts, for maintaining an up-to-date web page that includes information on its work, and for other organizational arrangements in accordance with the biennial workplan;

4. *Decides* that the Centre is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Centre for Integrated Assessment Modelling

1. The Centre for Integrated Assessment Modelling will continue to provide scientific support to the Convention on the development of cost-effective emission control strategies that protect human health and vegetation from the adverse effects of air pollution. The Centre will continue to develop an integrated assessment modelling tool for scientific assessment of past and future trends in air pollution throughout the ECE region.

2. The Centre reports on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Centre are to:

(a) Maintain, develop further and harmonize common methods and tools for the scientific assessment of cost-effective emission control strategies and to explore the distributions of costs and benefits across Parties;

(b) Maintain the GAINS model as a "state-of-the-art" tool for Convention analyses, integrate information from the various scientific bodies under EMEP and the Working Group on Effects in the GAINS model and organize ex post analyses by these scientific bodies;

(c) Improve methodologies and understanding of processes, parametrizations and linkages to climate, biodiversity and vegetation impacts;

(d) Enhance the modelling of multiscale air quality management approaches, from the urban to the hemispheric scale;

(e) Update the GAINS databases on energy and agricultural statistics, activity projections, emission inventories, emission control options and their costs, taking into account the latest national and international data sources, and consult with experts from Parties on these data;

(f) Facilitate the use of the GAINS model by Parties, for example, by providing online access to the model and its databases and providing training courses for GAINS model users;

(g) Provide support to and facilitate the involvement of Parties in Eastern Europe, the Caucasus and Central Asia, for example, through model training courses, support on the use of GAINS model data and tools and, to the extent funding allows, national versions of

the GAINS model; assess future scenarios and the cost-effectiveness of abatement strategies upon request by the Working Group on Strategies and Review;

(h) Perform model simulations to trace progress towards emission controls under the existing Protocols and support the design of new or revised Protocols, when necessary;

(i) Closely collaborate with:

(i) The Task Force on Emission Inventories and Projections and the Centre on Emission Inventories and Projections to improve emission estimates and projections;

(ii) The Meteorological Synthesizing Centre-West and the Task Force on Measurements and Modelling to use the latest version of the EMEP model for source-receptor relationships and the development of a methodology to assess local exposure;

(iii) The Task Force on Health and the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends to use the latest findings on exposure response relationships and impacts on biodiversity;

(iv) The Task Force on Hemispheric Transport of Air Pollution to assess cost-effective abatement strategies at the hemispheric scale.

(j) Exchange information with the Arctic Monitoring and Assessment Programme, the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, the Organization for Economic Cooperation and Development, the United Nations Environment Programme (UNEP), the World Health Organization and the World Bank Group to encourage cost-effective strategies for health and ecosystems at a global scale. Cooperate with: the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants on short-lived climate pollutants; UNEP on hemispheric and global emission scenarios; the European Commission on in-depth analyses for the member States of the European Union; the Artic Council and the Arctic Monitoring and Assessment Programme on modelling pollution controls that benefit the Arctic and the modelling of short-lived climate pollutant impacts; and the Baltic Marine Environment Protection Commission and the Commission for the Protection of the Marine Environment of the North-East Atlantic on the modelling of emissions from shipping;

(k) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/14

Revised mandate for the Centre on Emission Inventories and Projections

The Executive Body,

Recalling the provisions of article 9 and other relevant provisions of the Convention on Long-range Transboundary Air Pollution,

Recalling also the provisions of the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol),

Recalling further its decision to establish the Centre on Emission Inventories and Projections at its twenty fifth session in 2007 (ECE/EB.AIR.91, para. 27 (f)) upon the recommendation of the EMEP Steering Body on the reorganization of the emission-related work within EMEP (ECE/EB.AIR/GE.1/2007/9, annex II),

Recognizing the Centre's contribution to the scientific assessment of past trends and current status in air pollution throughout the United Nations Economic Commission for Europe (ECE) region and to the evaluation of the implementation of the Protocols to the Convention,

Acknowledging the support provided by the Centre on Emission Inventories and Projections to the Parties to the Convention and EMEP, among other things, through the following actions:

(a) Ensuring that all emission data reported by Parties are stored in a database, publicly accessible via the Centre on Emission Inventories and Projections website and presented in interactive data viewers;

(b) Providing the results of the initial checks of emission inventories (stage 1 and stage 2) to Parties and EMEP annually; organizing two cycles of in-depth reviews of emission inventories since 2008, with up to 10 Parties reviewed annually and 44 in a five-year cycle; developing a system for the annual review of adjustment applications and managing the process since 2015, including the assessment of the applications by two independent reviewers and submission of the recommendations of the expert review team to the EMEP Steering Body in a status report and their publication on the Centre on Emission Inventories and Projections website;

(c) Putting in place a module-based gridding system with detailed spatial resolution of 0.1° x 0.1° (longitude/latitude) and annual provision of data for modellers; publishing technical reports on methodologies used for gap filling and information on discrepancies between reported and expert emission estimates of the main pollutants, particulate matters, heavy metals and persistent organic pollutants.

Recognizing the need to update the mandate of the Centre on Emission Inventories and Projections to ensure its consistency with the provisions of the amended Protocols to the Convention, as well as its strategic priorities as set out in the following documents:

(a) The long-term strategy for the Convention on Long-range Transboundary Air Pollution for 2020–2030 and beyond (decision 2018/5, annex);

(b) The 2016 scientific assessment of the Convention;[17]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting that the annual costs of the centres cooperating within EMEP for the activities appearing in the work programme of the Steering Body of EMEP are covered in accordance

[17] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

with the EMEP Protocol, from contributions by the Parties to the Convention on the basis of the annual EMEP budget approved by the Executive Body upon the recommendation of the Steering Body to EMEP:

1. *Notes with appreciation* the hosting of the Centre on Emission Inventories and Projections by Environment Agency Austria;

2. *Adopts* the revised mandate of the Centre on Emission Inventories and Projections as contained in the annex to the present decision, which includes the key objectives and functions of the Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

3. *Decides* that the Centre is responsible for communicating with national experts, for maintaining an up-to-date web page that includes information on its work, and for other organizational arrangements in accordance with the biennial workplan;

4. *Decides* that the Centre is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, and reporting thereon, as well as for keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Centre on Emission Inventories and Projections

1. The Centre on Emission Inventories and Projections will continue to have principal responsibility for coordinating the emission-related work under EMEP.

2. The Centre reports on its activities and deliverables to the Steering Body to EMEP.

3. The functions of the Centre are to:

(a) Compile emission data reported by Parties to the Convention and import them into the EMEP/Centre on Emission Inventories and Projections database; maintain and improve the EMEP/Centre on Emission Inventories and Projections database system and the Centre on Emission Inventories and Projections website; Adjust the database system (WebDab, RepDab) according to new reporting requirements and reporting formats; make reported data accessible to public on the web;

(b) Carry out annual quality control of inventories reported under the Convention; evaluate timeliness, consistency and completeness of submitted data; plan and organize an annual technical in-depth review of submitted inventories; regularly improve/develop new tests for emission checking; set up review teams and communicate with Parties; communicate the results to the Parties and the EMEP Steering Body;

(c) Develop emission data sets for modellers (gridded data of EMEP pollutants for the EMEP area); calculate expert estimates for missing data and use a module-based gridding system and proxies for the spatial distribution of gap-filled emission data for the new EMEP grid domain in geographical coordinates (0.1° x 0.1° longitude/latitude); develop distribution of emissions for Parties that do not report gridded data; perform checks of gridded data; during a transition period, provide gridded data also in resolution 50 x 50km EMEP grid, if requested;

(d) Support the Implementation Committee in reviewing compliance with reporting obligations: carry out periodic review of compliance with Parties' reporting obligations and emission trends, based on emission and projection data submitted to EMEP and available in the WebDab emission database;

(e) Support EMEP by managing review of adjustment applications to emission reduction commitments or inventories and any supporting documentation submitted by Parties in accordance with Executive Body decisions 2012/3, 2012/4 and 2012/12; set up review teams and communicate with Parties; maintain the online database system for storage and review of approved adjustments and supporting documentation provided by Parties;

(f) Assess emission uncertainties by comparison of Convention data with emission data from other sources, such as the Joint Research Centre of the European

Commission, the International Institute for Applied Systems Analysis and the United Nations Framework Convention on Climate Change, and, to the extent possible, quantification of the differences;

(g) Cooperate closely with the secretariat, the Task Force on Emission Inventories and Projections and the European Environment Agency through capacity-building activities (training sessions, workshops, country visits) in Eastern Europe, the Caucasus and Central Asia. Furthermore, the Centre on Emission Inventories and Projections provides online ad hoc support to technical experts from the region;

(h) Build on the emission-related work within EMEP; cooperate with the other EMEP centres and task forces and the Arctic Monitoring and Assessment Programme, the Austrian Ministry of Environment, the European Environment Agency, the Joint Research Centre of the European Commission and the European Commission; Participate in relevant meetings organized by the partner organizations and EMEP bodies; contribute to joint reports with other centres;

(i) Carry out other tasks assigned to it by the EMEP Steering Body and the Executive Body.

Decision 2019/15

Revised mandate for the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes (EB.AIR/WG.1/2000/4, annex III), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes, including:

(a) Maintenance of a regionally extensive database on water chemistry and biology (aquatic macroinvertebrates) in areas in Europe and North America sensitive to air pollution;

(b) Developing and maintaining high data quality standards by developing and adhering to a manual of recommended methods, and undertaking an annual inter-calibration of chemical analyses and biological classifications;

(c) Documentation of widespread biological and chemical recovery of acid-sensitive waters as a response to reduced emissions of sulphur and nitrogen, through periodic trend assessments in water chemistry and biology, providing evidence that air pollution policy has its intended effect, but also highlighting that many sensitive surface waters remain acidified;

(d) Documentation of increased aquatic biodiversity as a result of reduced sulphur emissions;

(e) Documentation of mercury in fish in northern, boreal lakes, at levels that exceed limits advised for human consumption; for lakes that are impacted by air pollution there is so far little evidence that levels of mercury in fish are declining, implying that mercury pollution remains a concern;

(f) Providing evidence that climate change may present a delay for chemical and biological recovery of surface waters.

Recognizing the need to update the Programme's mandate to ensure its consistency with the provisions of the amended Protocols to the Convention, and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[18]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

[18] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

Noting with appreciation the hosting of the Programme Centre by the Norwegian Institute for Water Research and the ongoing leadership of the Programme Task Force by Norway,

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centre, in cooperation with the Chair of the Programme Task Force, is responsible for the detailed planning and coordination of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centre is responsible for coordinating the relevant activities under the Programme, including development of technical projects, provision of deliverables according to the workplan (including annual reports and access to all relevant information and data), participation in the relevant Task Force meetings, organizing technical workshops and training workshops, communicating with national experts and providing direct support to Parties, maintaining an up-to-date web page that includes information on the Programme and other organizational arrangements in accordance with the biennial workplan;

(e) The Programme Centre is responsible for the production and provision of all information and data on air pollution impacts on surface waters necessary for the implementation of the Convention and its Protocols by the Parties;

(f) The Programme Centre and the Chair of the Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes

1. The International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes will continue to assess, on a regional basis, the degree and geographical extent of the impact of atmospheric pollution on surface waters.

2. The Programme Centre and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The functions of the Programme Centre and the Task Force are to:

(a) Plan and conduct the technical work to assess, using monitoring data and other sources of scientific evidence:

(i) The degree and geographic extent of the impact of atmospheric pollution, in particular acidification, on surface water chemistry and biology – including biodiversity, and assess temporal trends and spatial patterns;

(ii) Spatial patterns and temporal trends of heavy metals, most importantly mercury, in aquatic ecosystems, related to atmospheric pollution;

(iii) The impact of persistent organic pollutants in aquatic ecosystems, related to atmospheric pollution;

(iv) The impact of confounding factors relating to air pollution impacts on surface waters such as climate, climate change and land-use;

(b) Contribute to:

(i) Assessing air pollution impacts on aquatic ecosystems through collating and reviewing scientific literature;

(ii) Updating the *Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends*[19] and related background documents with the latest relevant scientific knowledge.

(c) Promote international harmonization of monitoring practices by:

(i) Maintaining and updating a manual for methods and operation;

(ii) Conducting an annual chemical intercomparison and an annual biological inter-calibration;

(iii) Compiling a centralized database with data quality control and assessment capabilities.

(d) Support the Parties with the further development and implementation of methodologies described under paragraph 3 (a) and (b) above, including requirements of the new European Union National Emissions Ceilings Directive;[20] organize the annual Task Force meeting and invite Parties to attend, present their work related to the Programme and contribute to discussions and new developments;

(e) Support and encourage participation of countries in Eastern Europe, the Caucasus and Central Asia in Task Force meetings and activities;

(f) Collaborate with: the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems on the organization of meetings, and on assessing air pollution impacts on surface waters; other bodies under the Convention (such as the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends, the Coordination Centre for Effects and the Meteorological Synthesizing Centre-West) on thematic reports defined in the workplan;

(g) Collaborate with external partners, particularly the Minamata Convention on Mercury and the Arctic Monitoring and Assessment Programme of the Arctic Council, on issues of common interest;

(h) Carry out other tasks assigned to them by Working Group on Effects and the Executive Body.

[19] Most recent version available at http://icpmapping.org/Latest_update_Mapping_Manual.

[20] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, *Official Journal of the European Union*, L 344 (2016), pp. 1–31.

Decision 2019/16

Revised mandate for the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (EB.AIR/WG.1/2000/4, annex II), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests, including:

(a) Continuous data collection from the two levels of the forest ecosystem monitoring and research infrastructure installed by the member States; continuous improvement of quality assurance measures in the field and in laboratories and quality control measures during data submission;

(b) Data dissemination and evaluation activities in support of various research activities within the Convention and beyond;

(c) Joint evaluation activities comparing the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe modelling estimates and International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests field measurements, with important outcomes for both programmes; the launch of various publications relating observed effects, modelled Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe estimates and on-site measurement of environmental conditions, including soil conditions, affected by deposition and climate;

(d) Joint activities with the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems (integrated study) and the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops (ozone symptoms) ;

(e) Increased focus on evaluations of long-term trends using data from its respective surveys (deposition, crown condition and tree damage causes, meteorology, phenology and leaf area index, ozone concentrations and ozone-induced injury, ground vegetation, litterfall, parameters from soil and soil solution and foliar analyses, tree growth) under additional consideration of space, under additional consideration of space;

(f) Support to various studies on cause-effect relationship;

(g) Progress in the evaluation of biodiversity aspects derived from International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests field surveys (influence of nitrogen deposition could be shown);

(h) Increased consideration of/focus on other aspects relevant for forest ecosystems, such as climate change effects, in many cause-effect studies;

(i) Annual popularized publications; regular publication of a technical report and contributions to various scientific publications;

(j) Strengthened cooperation with the European Union on activities relevant to the European Union National Emissions Ceilings Directive[21] and pursued in cooperation with the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems, the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends, the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops, the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops and the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes;

(k) Update of the *Manual on methods and criteria for harmonized sampling, assessment, monitoring and analysis of the effects of air pollution on forests.*[22]

Recognizing the need to update the mandate of the Programme to ensure its consistency with the provisions of the amended Protocols to the Convention, and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[23]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting with appreciation the hosting of the Programme Centre by the Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, in Braunschweig, Germany, and the ongoing leadership of the Programme Task Force by Germany,

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centre, in cooperation with the Chair of the Programme Task Force, is responsible for the detailed planning and coordination of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centre is responsible for coordinating the relevant activities under the Programme, including development of technical projects, provision of deliverables according to the workplan (including annual reports and access to all relevant information

[21] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, *Official Journal of the European Union*, L 344 (2016), pp. 1–31.

[22] Most recent version available at http://icp-forests.net/page/icp-forests-manual.

[23] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

and data), participation in the relevant Task Force meetings, organizing technical workshops and training workshops, communicating with national experts and providing direct support to Parties, maintaining an up-to-date web page that includes information on the Programme and other organizational arrangements, in accordance with the biennial workplan;

(e) The Programme Centre is responsible for the compilation and provision of all information and data on air pollution impacts on forests necessary for the implementation of the Convention and its Protocols by the Parties;

(f) The Programme Centre and the Chair of the Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

1. The International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests will continue to monitor and assess the effects of air pollution on the condition and development of forest ecosystems in Europe and to contribute to a better understanding of cause-effect relationships in forest ecosystem functioning in various parts of the region.

2. The Programme Centre and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The functions of the Programme Centre and the Task Force are to:

(a) Support Parties in installing and operating their forest monitoring and research infrastructures by providing and constantly developing respective technical and analytical guidelines (for example, by updating the *Manual on methods and criteria for harmonized sampling, assessment, monitoring and analysis of the effects of air pollution on forests*[24] and organizing or supporting intercomparison courses);

(b) Permanently update and further develop the International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests collaborative database, carry out quality control and quality assurance measures on data submitted by Parties, provide assistance to Parties directly and via adequate documentation and foster dissemination of high-quality data within and outside of the Convention;

(c) Contribute to the work and publications of other international institutions (such as the European Union, the Food and Agriculture Organization of the United Nations and the Acid Deposition Monitoring Network in East Asia) and research institutes to promote the Convention's visibility and its aims and to ensure the further development of evaluation techniques and strategies regarding possible cause-effect relationships;

(d) Support Parties (in general) by organizing annual Task Force meetings, workshops and related activities to exchange experiences and make suggestions to further develop the monitoring and research activities of the International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests at all levels;

(e) Support specifically the Parties in Eastern Europe, the Caucasus and Central Asia and further encourage them to intensify or install forest monitoring infrastructures in line with International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests standards;

(f) Further collaborate with thematically related international cooperative programmes (such as the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems, the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends and the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation

[24] Most recent version available at http://icp-forests.net/page/icp-forests-manual.

and Crops) and Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe bodies (such as the Meteorological Synthesizing Centre-West) by designing joint evaluations, organizing common scientific events and producing joint publications;

(g) Carry out other tasks assigned to them by the Working Group on Effects and the Executive Body.

Decision 2019/17

Revised mandate for the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops (EB.AIR/WG.1/2000/4, annex V), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops, including:

(a) The establishment of more than 20 ozone flux-based critical levels for vegetation (including forests) – biologically a more relevant indicator of the risk of ozone impacts on vegetation than concentration-based critical levels – and identifying areas most at risk of ozone impacts;

(b) Provision of evidence of ozone impacts on vegetation, including interactions with nitrogen pollution and climate change, and consequences for ecosystem services and biodiversity, showing that impacts are widespread;

(c) Demonstrating that no clear trends of ozone impacts on vegetation have been observed in the last two decades, hence ozone pollution remains of global concern, with background concentrations rising in Europe, contributing to impacts on vegetation;

(d) Monitoring of heavy metal and nitrogen concentrations in naturally growing mosses since 1990, identifying declines in concentrations in many areas of Europe with hotspots of heavy metal and nitrogen pollution still remaining;

(e) Identifying considerable decline in cadmium and lead concentrations in mosses since 1990 and, to a lesser extent, mercury concentrations, thus providing evidence for the success of heavy metal air pollution abatement policies in Europe, with mercury pollution remaining of global concern.

Recognizing the need to update the Programme's mandate to ensure its consistency with the provisions of the amended Protocols to the Convention, and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[25]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting with appreciation the hosting of the Programme Centre by the Centre for Ecology and Hydrology at Bangor, the United Kingdom of Great Britain and Northern Ireland, and the ongoing leadership of the Task Force by the United Kingdom of Great Britain and Northern Ireland,

[25] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centre, in cooperation with the Chair of the Programme Task Force, is responsible for the detailed planning and coordination of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centre is responsible for coordinating the relevant activities under the Programme, including development of technical projects, provision of deliverables according to the workplan (including annual reports and access to all relevant information and data), participation in the relevant Task Force meetings, organizing technical workshops and training workshops, communicating with national experts, providing direct support to Parties, maintaining an up-to-date web page that includes information on the Programme and other organizational arrangements, in accordance with the biennial workplan;

(e) The Programme Centre is responsible for the production and provision of information and data on air pollution impacts on natural vegetation and crops necessary for the implementation of the Convention and its Protocols by the Parties;

(f) The Programme Centre and the Chair of the Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops

1. The International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops will continue to investigate the impacts of air pollutants on crops and natural vegetation.

2. The Programme Centre and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The functions of the Programme Centre and the Task Force are to:

(a) Plan and conduct technical work to collate and review evidence of:

(i) Air pollution impacts on vegetation from monitoring activities, experiments, surveys and the literature, including impacts in a changing climate, at the local, regional and global scale, and assess spatial patterns and temporal trends;

(ii) Spatial patterns and temporal trends of the deposition of, for example, heavy metals, nitrogen and persistent organic pollutants to vegetation, using naturally growing mosses as biomonitors.

(b) Develop further and apply flux-based ozone critical levels for vegetation; map areas at risk of ozone impacts on vegetation and exceedances of critical levels at the regional

and global scale in the current and future climate; update the *Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends*[26] and associated background documents with the latest relevant scientific knowledge; collate and review information on impacts of air pollution on food production (including economic assessments), ecosystem services and biodiversity;

(c) Encourage outreach activities and train new partners, in all Parties and other countries (for example, the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops-Asia network), to apply methodologies described in paragraph 3 (a) and (b) above and liaise with global networks and initiatives inside and outside the Convention to contribute to achieving the Sustainable Development Goals; invite new partners to attend the annual Task Force meeting and specific workshops;

(d) Support Parties in further developing and implementing the methodologies described in paragraph 3 (a) and (b) above, including requirements of the new European Union National Emissions Ceilings Directive;[27] organize the annual Task Force meeting and invite Parties to attend, present their work related to the Programme and contribute to discussions and new developments;

(e) Following the transfer of the coordination of the moss survey to monitor deposition of specified air pollutants (see paragraph 3 (a) (ii) above) to the Russian Federation in 2014 to enhance participation of countries in Eastern Europe, the Caucasus and Central Asia, use contacts made within this network to stimulate participation in ozone-related activities; translate relevant documents into Russian to stimulate knowledge transfer and encourage the organization of relevant meetings and workshops in countries in Eastern Europe, the Caucasus and Central Asia;

(f) Collaborate with: the International Cooperative Programme on Assessment and Monitoring of Air Pollution on Forests on monitoring and modelling ozone impacts on forests and monitoring deposition of relevant air pollutants to mosses; the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends on further developing critical levels and loads for vegetation; the Meteorological Synthesizing Centre-West on modelling ozone fluxes and nitrogen deposition to vegetation; the Meteorological Synthesizing Centre-East on modelling heavy metal deposition to vegetation; the Task Force on Integrated Assessment Modelling and the Centre for Integrated Assessment Modelling on modelling ozone fluxes in the Greenhouse Gas and Air Pollution Interactions and Synergies model; and the Task Force on Hemispheric Transport of Air Pollution on modelling ozone fluxes to vegetation using Task Force on Hemispheric Transport of Air Pollution scenarios and assess implications for food production and ecosystem services;

(g) Collaborate with: the Tropospheric Ozone Assessment Report – initiated by the International Global Atmospheric Chemistry Project – on producing reports and generate globally easily accessible ozone exposure and dose metrics; and the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants and future United Nations Environment Programme initiatives benefiting from assessment of the risk of ozone impacts on vegetation;

(h) Carry out other tasks assigned to them by the Working Group on Effects and the Executive Body.

[26] Most recent version available at http://icpmapping.org/Latest_update_Mapping_Manual.

[27] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, *Official Journal of the European Union*, L 344 (2016), pp. 1–31.

Decision 2019/18

Revised mandate for the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems (EB.AIR/WG.1/2000/4, annex VI), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the International Cooperative Programme on Integrated Monitoring of Air Pollution on Ecosystems, including:

(a) Maintenance of a regionally extensive database on intensively monitored background sites in Europe, valuable for assessing both air pollution and climate change impacts and their interactions; publication of assessment results in high-class scientific journals;

(b) Documentation of long-term complex impacts and recovery of sulphur and nitrogen deposition on both chemical and biological variables;

(c) Assessment of long-term trends and fluxes of heavy metals in various ecosystem compartments;

(d) Provision of evidence of negative effects on plant species richness when nitrogen deposition exceeds the critical load;

(e) Setting-up of dynamic modelling systems that have enabled assessment of impacts of future nitrogen and sulphur emission/deposition scenarios;

(f) Validation of critical load concepts using both empirical data and modelling;

(g) Close cooperation with other international cooperative programmes and the Joint Expert Group on Dynamic Modelling on ecosystem impact assessment and dynamic modelling;

(h) Development and maintenance of European monitoring and research infrastructures together with the Integrated European Long-Term Ecosystem, Critical Zone and Socio-Ecological Research Infrastructure.

Recognizing the need to update the Programme's mandate to ensure its consistency with the provisions of the amended Protocols to the Convention and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[28]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

[28] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

Noting with appreciation the hosting of the Programme Centre by the Finnish Environment Institute in Helsinki and the ongoing leadership of the Task Force by Sweden,

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centre to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centre, in cooperation with the Chair of the Programme Task Force, is responsible for the detailed planning, coordination and evaluation of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centre is responsible for maintaining the database, conducting and coordinating evaluations of the data and reporting and disseminating the Programme's results;

(e) The Programme Centre is responsible for coordinating the relevant activities under the Programme, including development of technical projects, provision of deliverables according to the workplan (including annual reports and access to all relevant information and data), participation in the relevant Task Force meetings, organizing technical workshops and training workshops, communicating with national experts and providing direct support to Parties, maintaining an up-to-date web page that includes information on the Programme and other organizational arrangements, in accordance with the biennial workplan;

(f) The Programme Centre and the Chair of the Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems

1. The International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems will continue to monitor the state of ecosystems, their changes and effects of air pollutants and climate change from a long-term perspective, and to develop and validate models for the simulation of ecosystem responses.

2. The Programme Centre and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The functions of the Programme Centre and the Task Force are to:

(a) Provide information on the state of ecosystems and their long-term changes, with respect to the regional variation and impact of selected air pollutants, including effects on biota, particularly to:

(i) Monitor the state of natural/semi-natural ecosystems and provide explanations for changes, in terms of causative environmental factors;

(ii) Develop and validate models for simulation of ecosystem effects and use these to estimate responses to actual or predicted changes in pollution stress;

(iii) Carry out biomonitoring for detecting changes and develop biota indicators identifying future alterations;

(iv) Develop further tools to guide users in interpreting the available data and their use in (effects) models.

(b) Prioritize and rationalize the Programme's network, monitoring activities and data reporting;

(c) Monitor and assess long-term trends, stores and fluxes of elements and compounds of priority interest to the Convention (for example, nitrogen and heavy metals), and other elements and parameters important for the evaluation of environmental effects (such as base cations, carbon and phosphorous) and for meeting relevant international data requirements;

(d) Develop dynamic models of biogeochemical effects and recovery, risk assessment and interactions with climate change, with emphasis on timescales of ecosystem effects;

(e) Develop biomonitoring and assessment of biological data, particularly on vegetation;

(f) Collaborate with ecosystem-oriented international cooperative programmes, the Centre for Dynamic Modelling and Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe centres on impact assessment using monitoring data and dynamic modelling;

(g) Collaborate with external partners, particularly European research infrastructures (European Strategy Forum on Research Infrastructures/Long-term Ecosystem in Europe Research Infrastructure and LifeWatch) on impact assessments and modelling and database infrastructures;

(h) Carry out other tasks assigned to them by the Working Group on Effects and the Executive Body.

Decision 2019/19

. Revised mandate for the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments (EB.AIR/WG.1/2000/4, annex IV), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments, including,

(a) Maintenance of a regionally extensive database on pollution, climate, corrosion and soiling in a network of urban, rural and industrial test sites in Europe and North America;

(b) Developing and maintaining high quality standards in data collection by adhering to relevant International Organization for Standardization standards within ISO TC 156 for exposure and evaluation of corrosion attack on materials;

(c) Development of corrosion dose-response functions for the sulphur dioxide dominating situation, corrosion dose-response functions for the multi-pollutant situation and soiling dose-response functions for a variety of materials;

(d) Regular exposure of indicator materials for periodic trend assessments (every third year) enabling quantification of trends in pollution, corrosion and soiling;

(e) Several case studies on United Nations Educational, Scientific and Cultural Organization cultural heritage sites as policy relevant indicators for verification of air pollution effects on real objects of cultural heritage, including economic assessment.

Recognizing the need to update the mandate of the Programme to ensure its consistency with the provisions of the amended Protocols to the Convention and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[29]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting with appreciation the hosting of the Programme Centre by Research Institutes of Sweden/Corrosion and Metals Research Institute in Stockholm and the ongoing leadership of the Task Force by Italy and Sweden,

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centre to be carried out on an ongoing basis, whereas additional activities

[29] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centre, in cooperation with the Chair of the Programme Task Force, is responsible for the detailed planning, coordination and evaluation of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centre is responsible for the production and provision of quantitative policy-relevant information on monitored and modelled air pollution effects on materials necessary for the implementation of the Convention and its Protocols by the Parties;

(e) The Programme Centre is responsible for coordinating the relevant activities under the Programme, including development of technical projects, provision of deliverables according to the workplan (including annual reports and access to all relevant information and data), participation in the relevant Task Force meetings, organizing technical workshops and training workshops, communicating with national experts, providing direct support to Parties, maintaining an up-to-date web page that includes information on the Programme and other organizational arrangements, in accordance with the biennial workplan;

(f) The Programme Centre and the Chair of the Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments

1. The International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments will continue to evaluate the effects of air pollutants on the atmospheric corrosion and soiling of important materials, and to assess long-term corrosion and soiling trends attributable to atmospheric pollution, including the further development of dose-response functions quantifying the corrosion effects under different environmental conditions to support the economic evaluation of air pollution damage.

2. The Programme Centre and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The functions of the Programme Centre and the Task Force are to:

(a) Monitor and assess the impact of the environment on corrosion and soiling effects on materials and their trends by:

(i) Maintaining and developing an international network of atmospheric corrosion test sites;

(ii) Conducting regular short-term (one-year) and long-term (four-year) exposure assessments of corrosion and soiling specimens;

(iii) Collecting and measuring environmental data at test sites, in collaboration with

the national focal points for test sites, the sub-centres for materials and the sub-centre for environmental data.

(b) Derive exposure-response functions for corrosion and soiling effects of air pollutants, in combination with other stresses such as climate change and chloride deposition;

(c) Gather information on policy-relevant user-friendly indicators to evaluate air pollution effects on materials by conducting case studies on United Nations Educational, Scientific and Cultural Organization cultural heritage sites, including:

(i) Assessment of the environment and condition;

(ii) Risk assessment;

(iii) Economic assessment of damages of corrosion and soiling, collaboration with the sub-centre for cultural heritage in Italy.

(d) Investigate the relevance of short-lived climate forcers, particularly black carbon, from the viewpoint of soiling of materials;

(e) Further develop modelling and mapping procedures by supporting regular updates of chapter IV of the *Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends*[30] regarding procedures for mapping corrosion and soiling effects on materials, in collaboration with the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends;

(f) Further develop and improve methodologies for measuring air pollution effects of materials through cooperation with relevant non-Convention standardization bodies, such as the International Organization for Standardization Technical Committee 156 Corrosion of metals and alloys;

(g) Carry out other tasks assigned to them by the Working Group on Effects and the Executive Body.

[30] Most recent version available at http://icpmapping.org/Latest_update_Mapping_Manual.

Decision 2019/20

Revised mandate for the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference for the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends (EB.AIR/WG.1/2000/4, annex VII), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Noting the long-term strategy for the effects-oriented activities (ECE/EB.AIR/2009/17), adopted at its twenty-eighth session (ECE/EB.AIR/99, para. 25 (b),

Further noting the Guidelines for reporting on the monitoring and modelling of air pollution effects (ECE/EB.AIR/2008/11, ECE/EB.AIR/WG.1/2008/16/Rev.),

Acknowledging the achievements of the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends and the Joint Expert Group on Dynamic Modelling, including:

(a) Development and maintenance of critical levels and loads methodologies and databases to assess the risk to ecosystems of acidification, eutrophication and heavy metals. The approach has been extended to include dynamic modelling methodologies to enable the simulation and evaluation of the temporal development of these risks to future policy target years;

(b) Exploration of methodologies for the development of critical loads for biodiversity to assess the impact of nitrogen and sulphur deposition on endpoints for biodiversity in general and on the occurrence of plant species in particular;

(c) Compilation, by the Coordination Centre for Effects, of national critical loads data submitted by national focal centres, into a database of critical loads for acidification, eutrophication and biodiversity, applying gap-filling methods and compiling background information for European Parties that do not provide their national critical loads data; data from Canada and the United States of America were collected and compiled by the Coordination Centre for Effects to complete the geographic coverage of the United Nations Economic Commission for Europe region;

(d) Development of methodologies to include dynamics of ecosystem response to air pollution, including biodiversity, time lags and interactions with climate change and land use change;

(e) Development of modelling and mapping methodologies and guidance, which are documented in Coordination Centre for Effects reports, publications in the scientific literature and formal documents submitted under the Convention to the annual joint sessions 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;

(f) Publication and update of the *Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and*

Trends,[31] describing modelling and mapping methodologies. The Manual provides a description of harmonized indicators to establish critical levels and loads and methods to assess the impacts of acidification, eutrophication, heavy metals, ozone and particulate matter on terrestrial and aquatic ecosystems, crops or building materials. It has been updated in collaboration with the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops and the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments;

(g) Identification of United Nations Economic Commission for Europe regional and national areas with critical load exceedance and assessment of the magnitude of these exceedances, in collaboration with the Centre for Integrated Assessment Modelling, the Meteorological Synthesizing Centre-East and the Meteorological Synthesizing Centre-West;

(h) Assisting the Working Group on Effects, the Working Group on Strategies and Review and the Task Force on Integrated Assessment Modelling by providing scientific advice regarding the use and interpretation of data and modelling methodologies for critical levels and loads, exceedance maps with comprehensive information on air pollution effects on ecosystems for interpretation of policy effectiveness, for use in cost-benefit analysis; ecosystem response over time and future scenarios;

(i) Making available the data produced under the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends according to decision 2006/1 on data availability under the Convention (ECE/EB.AIR/89/Add.1).

Recognizing the need to update the Programme's mandate to ensure its consistency with the provisions of the amended Protocols to the Convention and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[32]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting the recommendation of the Working Group on Effects to transform the Joint Expert Group on Dynamic Modelling into a programme centre under the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends as of 1 January 2020,

Noting with appreciation the hosting of the Coordinating Centre for Effects by the German Environment Agency in Dessau, Germany, and the ongoing leadership of the Task Force by France and the offer by the Swedish Environmental Research Institute in Stockholm to host the Centre for Dynamic Modelling,

1. *Adopts* the Programme's revised mandate as contained in the annex to the present decision, which includes the key objectives and functions of the Programme Task Force and the Programme Centres to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Programme Centres, in cooperation with the Chair of the Task Force, are responsible for the detailed planning, coordination and evaluation of the Programme;

(b) The lead country or countries are responsible for leading and coordinating the Task Force's ongoing work and tasks, organizing its meetings, communicating with

[31] Most recent version available at http://icpmapping.org/Latest_update_Mapping_Manual.

[32] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

participating experts and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Task Force are appointed by the lead country or countries to carry out these tasks;

(c) In the event that a lead country needs to discontinue its leadership role, it is encouraged to notify the secretariat, Co-Chairs, and other lead countries as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead country will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Task Force operations are provided to the appropriate country or person(s);

(d) The Programme Centres and the Chair of the Programme Task Force are responsible for carrying out the work assigned to them in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of their work.

Annex

Revised mandate for the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends

1. The International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends will continue to provide the Working Group on Effects and the Executive Body and other subsidiary bodies with comprehensive information on: critical levels and loads and their exceedances for selected pollutants; the development and application of other methods for effects-based approaches; and the modelling and mapping of the present status and trends in impacts of air pollution.

2. The Programme Centres and the Chair of the Task Force report on their activities and deliverables to the Working Group on Effects.

3. The common functions of the Programme Task Force, the Coordinating Centre for Effects and the Centre for Dynamic Modelling are to:

(a) Collaborate with and provide guidance to national focal centres with comprehensive information on the following:

(i) Critical levels and loads and the risk of exceedances for selected pollutants and effects on appropriate endpoints of the natural environment;

(ii) The modelling and mapping of the present status and trends of impacts of air pollution on terrestrial and aquatic ecosystems for the United Nations Economic Commission for Europe region.

(b) Organize annual meetings and workshops, as appropriate, to share knowledge on critical loads and modelling methodologies addressing the risk of impacts on terrestrial and aquatic ecosystems with all Parties, particularly with the Parties in Eastern Europe, the Caucasus and Central Asia;

(c) Carry out tasks adopted in the science-related part of the workplan of the Convention established by the Working Group on Effects and the Executive Body, provided that sufficient funding is available;

(d) Support the Working Group on Effects, the Working Group on Strategies and Review and the Task Force on Integrated Assessment Modelling with scientific advice regarding the use and interpretation of data and modelling methodologies for critical levels and loads;

(e) Collaborate with other international cooperative programmes to develop understanding and dose-response relationships for terrestrial and aquatic ecosystems, promote participation of all Parties and relevant long-range transport of atmospheric pollutants Convention bodies and seek ways in which collectively gathered knowledge and information can be used in the common framework of dynamic models;

(f) Collaborate with the Centre for Integrated Assessment Modelling and the Task Force on Integrated Assessment Modelling in elaborating and assessing pollution

scenarios, and with the Meteorological Synthesizing Centre-East and the Meteorological Synthesizing Centre-West of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe to compile deposition maps to enable the calculation of critical loads and their exceedances;

(g) Carry out development and application of methods for effect-based approaches, including:

(i) Understanding of timescales and time lags of responses to changes in air pollution;

(ii) Designs for development of dynamic models describing the response over time;

(iii) The modelling of impacts on suitable indicators of biodiversity and of possible impacts on selected ecosystem services in collaboration with other Working Group on Effects bodies.

(h) Facilitate and be an entry point for cooperation between:

(i) The Convention and non-Convention research groups and organizations, to increase visibility and widen use of results of modelling critical loads and their exceedance achieved by the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends in a cost-effective way. Collaboration with partners outside the Convention includes, in particular, the Arctic Monitoring and Assessment Programme, the United Nations Environment Programme, the Convention on Biological Diversity and the European Union;

(ii) The Working Group on Effects and research groups and networks such as the Long-term Ecosystem Research Network and LifeWatch active in development and application of dynamic models of air pollution effects, climate change and land use outside the Working Group on Effects.

(i) Carry out other tasks assigned to them by the Working Group on Effects and the Executive Body.

4. The functions of the Programme Task Force are to:

(a) Plan, organize and evaluate the Programme's activities; review and assess methodologies and databases on critical levels and loads, and their exceedances and (trends of) the risk of impacts on suitable indicators for terrestrial and aquatic ecosystems' health;

(b) Document modelling and mapping methodologies in the *Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends*;[33]

(c) Make recommendations regarding further development of effect-based approaches and future modelling and mapping requirements.

5. The functions of the Coordinating Centre for Effects are to:

(a) Develop and implement databases for calculation of critical loads, their exceedances and their mapping at United Nations Economic Commission for Europe scale under the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends and provide technical advice regarding use and interpretation of critical loads and exceedances;

(b) Implement established knowledge on effects of major air pollutants on the natural environment in modelling methodologies, including information exchanges with other Convention and Research Groups on available dose-response relationships assessed in order to protect ecosystems;

[33] Most recent version available at http://icpmapping.org/Latest_update_Mapping_Manual.

(c) Support the development of dynamic models describing the response over time of suitable indicators for biodiversity, in collaboration with other international cooperative programmes and the Centre for Dynamic Modelling;

(d) Apply methods for effect-based approaches, including dynamic modelling and the modelling of impacts on suitable indicators of biodiversity;

(e) Conduct periodic training sessions and workshops to assist national focal centres in their work;

(f) Maintain and update relevant databases and serve as a clearing house for data collection and exchanges regarding critical levels and loads among Parties and bodies under the Convention;

(g) Produce information and data necessary for implementation of the Convention and its Protocols in relation to indicators for natural ecosystems' health, including critical loads and their exceedances.

6. The functions of the Centre for Dynamic Modelling are to:

(a) Develop and promote methods focusing on dynamic modelling to complement ecosystem effect assessment work in collaboration with all Working Group on Effects bodies;

(b) Develop, test and elaborate suitable indicators of biodiversity using dynamic models that can be utilized for calculating critical loads, in close collaboration with the Coordination Centre for Effects, the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends Task Force and other international cooperative programmes;

(c) Identify gaps in ecosystem effect modelling under the Working Group on Effects, and propose areas where additional effort would be beneficial;

(d) Carry out the development and maintenance of the common Working Group on Effects website, with the aim of providing common access to the work of the Working Group on Effects from one entry point;

(e) Facilitate cooperation between the Working Group on Effects and non-Convention research groups and organizations to increase visibility and widen use of results achieved by the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends specifically and other international cooperative programmes in general, in a cost-effective way;

(f) Promote participation of all Parties and relevant Convention bodies and seek ways in which collectively gathered knowledge and information can be used in the common framework of dynamic models;

(g) Provide links between long-term monitoring and dynamic model development groups within the Convention.

Decision 2019/21

Revised mandate for the Joint Task Force on the Health Aspects of Air Pollution

The Executive Body,

Recalling the relevant provisions of articles 7 and 8 of the Convention on Long-range Transboundary Air Pollution,

Recalling also its decision 1999/2 concerning the structure and organization of work,

Recalling further the terms of reference of the Joint Task Force on the Health Aspects of Air Pollution (EB.AIR/WG.1/2000/4, annex VIII), noted at its eighteenth session (ECE/EB.AIR/71, para. 58 (c)),

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Acknowledging the achievements of the Joint Task Force on the Health Aspects of Air Pollution, including:

(a) Providing scientific evidence of health effects of long-range transboundary air pollutants by delivering a series of health assessment reports by pollutant: persistent organic pollutants (2003); particulate matter, ozone and nitrogen dioxide (2003); particulate matter (2006); heavy metals (2007); particulate matter from various sources (2007); ozone (2008); black carbon (2012); and residential heating with wood and coal (2015);

(b) Holding over 20 annual meetings providing a platform where Parties could share recent policies and activities related to air pollution and health;

(c) Providing updates on progress in research on the health impact of air pollution;

(d) Contributing to Parties' capacity-building and supporting the effective implementation of the existing Protocols and their revisions.

Recognizing the need to update the Joint Task Force's mandate to ensure its consistency with the provisions of the amended Protocols to the Convention, and its strategic priorities, as set out in the following documents:

(a) The revised long-term strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/142/Add.2);

(b) The 2016 scientific assessment of the Convention;[34]

(c) The policy response to the 2016 scientific assessment of the Convention (ECE/EB.AIR/WG.5/2017/3 and Corr.1 and ECE/EB.AIR/2017/4).

Noting with appreciation the ongoing leadership of the Joint Task Force by the World Health Organization European Centre for Environment and Health and its function as a Centre for Work on the Health Effects of Air Pollution,

1. *Adopts* the Joint Task Force's revised mandate as contained in the annex to the present decision, which includes the Joint Task Force's key objectives and functions to be carried out on an ongoing basis, whereas additional activities and specific tasks and associated deliverables to be carried out in a shorter time frame will be included in the biennial workplans for the implementation of the Convention;

2. *Decides* that:

(a) The Joint Task Force will consist of experts nominated by Parties to the Convention;

[34] See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, 2016) and United States Environmental Protection Agency and Environment and Climate Change Canada, *Towards Cleaner Air: Scientific Assessment Report 2016 – North America* (2016).

(b) The lead organization is responsible for leading and coordinating the Joint Task Force's ongoing work and tasks, organizing its meetings, communicating with participating experts, maintaining an up-to-date web page that includes information on the Joint Task Force's activities, work, meetings and participants and other organizational arrangements, in accordance with the biennial workplan. Chairs of the Joint Task Force are appointed by the lead organization to carry out these tasks;

(c) In the event that the lead organization needs to discontinue its leadership role, it is encouraged to notify the secretariat as soon as possible, but preferably no later than one year prior to the time it will need to cease its leadership activities. The withdrawing lead organization will make every effort to ensure a smooth transition to the next leadership model, by ensuring that all data and any other information required for Joint Task Force operations are provided to the appropriate country, organization or person(s);

(d) The Joint Task Force is responsible for the production and provision of all information and data on the health effects of air pollution necessary for the implementation of the Convention and its Protocols by the Parties;

(e) The Joint Task Force is responsible for carrying out the work assigned to it in the biennial workplans approved by the Executive Body, reporting thereon and keeping other relevant bodies apprised of its work.

Annex

Revised mandate for the Joint Task Force on the Health Aspects of Air Pollution

1. The Joint Task Force on the Health Aspects of Air Pollution will continue to evaluate and assess the health effects of long-range transboundary air pollution and provide necessary information on the subject. Assessments aim to quantify the contribution of transboundary air pollution to human health risks and help define priorities for guiding future monitoring and abatement strategies.

2. The Joint Task Force reports on its activities and deliverables to the Working Group on Effects.

3. The Joint Task Force's functions are to:

(a) Quantify health impacts of long-range transboundary air pollution;

(b) Expand the knowledge base by consolidating existing evidence on health outcomes of exposure to air pollution and by identifying emerging issues relevant to health;

(c) Provide a forum to the Parties and expertise to exchange recent research, experiences and suggestions on the health impact of air pollution;

(d) Assist Parties in quantifying the health impact of transboundary air pollution and defining priorities to guide future monitoring and abatement strategies;

(e) Facilitate communication by Parties of health risks associated with air pollution exposure;

(f) Contribute to capacity-building on quantifying health impacts of air pollution and assessing the health benefits from reducing air pollution in Eastern Europe, the Caucasus and Central Asia by developing a curriculum and supporting the use of health impact quantification tools;

(g) Cooperate with the Working Group on Effects and the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe on tools and methods for facilitating streamlining of methodological approaches to assessing the effects of air pollution;

(h) Collaborate with the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe to assess the hazardousness of air pollutants in the region;

(i) Collaborate with other processes and organizations (the European Environment and Health Process, Health 2020, the Paris Agreement, the Sustainable

Development Goals and the United Nations Environment Assembly of the United Nations Environment Programme) to identify and realize synergies;

(j) Carry out other tasks assigned to it by the Working Group on Effects and the Executive Body.

Decision 2019/22

Amendment to decision 2002/1 on the financing of core activities

The Executive Body,

Recalling its decision 2002/1 on the financing of core activities, as amended by decision 2018/8,

Recognizing the importance of the further development and promotion of methodologies which take into account the dynamics of ecosystem response to air pollution, including biodiversity, time lags and interactions with climate change and land use change,

Noting the recommendation by the fifth joint session of the EMEP Steering Body and the Working Group on Effects (ECE/EB.AIR/GE.1/2019/2 – ECE/EB.AIR/WG.1/2019/2) to transform the Joint Expert Group on Dynamic Modelling into a designated international centre under the International Cooperative Programme on Modelling and Mapping,

Noting with appreciation the leadership of the Joint Expert Group by Sweden since 2000,

Noting the change in the host institution of the Programme Coordinating Centre for the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests,

Recalling its request to the secretariat to present a revised scale of recommended contributions, based on the most recent United Nations scale of assessments (ECE/EB.AIR/142, para. 71 (i)),

Decides to amend its decision 2002/1, as follows:

1. In appendix I,

(a) After the words "Programme Main Coordinating Centre for the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests" the words "*at the Federal Research Centre for Forestry and Forest Products, Hamburg, Germany*" are replaced with "*at the Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Eberswalde, Germany*";

(b) At the end of the list, the following is added: "Centre for Dynamic Modelling: *at the Swedish Environmental Research Institute, Stockholm, Sweden*".

2. In appendix II, the existing table is replaced with the following:

Scale of recommended contributions

(The following is the scale of contributions referred to in paragraph 5)

Parties to the Convention [a]	*Per cent*
Non-European Union countries	
Albania	0.022
Armenia	0.020
Azerbaijan	0.137
Belarus	0.137
Bosnia and Herzegovina	0.033
Georgia	0.022
Iceland	0.078
Kazakhstan	0.497

Parties to the Convention [a]	*Per cent*
Kyrgyzstan	0.006
Liechtenstein	0.025
Monaco	0.031
Montenegro	0.011
North Macedonia	0.020
Norway	2.104
Republic of Moldova	0.008
Russian Federation	6.710
Serbia	0.078
Switzerland	3.212
Turkey	3.825
Ukraine	0.159
European Union countries	
Austria	1.889
Belgium	2.291
Bulgaria	0.128
Croatia	0.215
Cyprus	0.100
Czechia	0.868
Denmark	1.546
Estonia	0.109
Finland	1.175
France	12.352
Germany	16.992
Greece	1.021
Hungary	0.575
Ireland	1.035
Italy	9.227
Latvia	0.131
Lithuania	0.198
Luxembourg	0.187
Malta	0.047
Netherlands	3.784
Poland	2.238

Parties to the Convention [a]	*Per cent*
Portugal	0.977
Romania	0.552
Slovakia	0.427
Slovenia	0.212
Spain	5.988
Sweden	2.528
United Kingdom	12.743
European Union	3.33
Total	**100 000**

[a] Canada and United States of America: voluntary contributions

Decision 2019/23

Amendment of annex VII to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, as amended on 4 May 2012

The Parties to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, as amended on 4 May 2012, meeting within the thirty-ninth session of the Executive Body,

Decide to amend annex VII to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) to the Convention on Long-range Transboundary Air Pollution, as amended on 4 May 2012, as follows:

Article 1
Amendment of annex VII

In paragraph 4, for the words “and 31 December 2019” there shall be substituted “and 31 December 2024”.

Article 2
Entry into force

In accordance with article 13bis, paragraph 7, of the Protocol, for those Parties that have accepted the procedure set out in that paragraph, this amendment shall become effective for those Parties which have not submitted a notification to the Depositary in accordance with article 13, paragraph 7 (a), of the Protocol as amended on the expiry of one year from the date of its communication to all Parties by the Executive Secretary of the Commission, provided that at least sixteen Parties have not submitted such a notification.

For those Parties that have not accepted the procedure set out in article 13bis, paragraph 7, of the Protocol, this amendment shall become effective in accordance with the procedure set out in article 13bis, paragraph 3.