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**Economic Commission for Europe****Executive Body for the Convention on Long-range  
Transboundary Air Pollution**

**Twenty-ninth session**

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**Report of the Executive Body on its twenty-ninth session****Addendum****2012–2013 workplan for the implementation of  
the Convention on Long-range Transboundary  
Air Pollution****Contents**

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## **2012–2013 workplan**

Pursuant to decision 2011/14, in addition to tasks included in this workplan, subsidiary bodies, taskforces and expert groups will ensure that they also undertake any tasks identified for them in the 2012–2013 biennial period in the Action Plan for the Implementation of the Long-term Strategy for the Convention on Long-range Transboundary Air Pollution.

Upon having taken account of the report to be submitted by the ad hoc group of experts to the Executive Body in December 2012, as stipulated by decision 2011/14, there may be a need for the Executive Body to amend this workplan to ensure the implementation of tasks that have not been designated a specific timeline due to their ongoing nature but which are nevertheless appropriate for implementation in the 2012-2013 biennial period.

## **1. Strategies and policies**

### **1.1 Strategies and review**

*Description/objectives:* To assess ongoing scientific and technical activities for the review of existing protocols or the preparation of new ones; to negotiate revisions of protocols, including their annexes; to promote the exchange of technology; and to prepare proposals for strategic developments under the Convention. The Working Group on Strategies and Review will assist the Executive Body in all policy-related issues.

*Main activities and time schedule:* Taking into account relevant activities under the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and the Working Group on Effects, as well as the initiatives of the European Union (EU) and other Parties to the Convention, and on the basis of information received from its expert groups and task forces, the Working Group on Strategies and Review will, in particular:

- (a) Finalize negotiations on proposed amendments to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) in 2012, as mandated by the Executive Body;
- (b) Finalize negotiations on proposed amendments to the Protocol on Heavy Metals, as mandated by the Executive Body in 2010 (ECE/EB.AIR/106, para. 57);
- (c) Review progress in the exchange of information and technology, including work carried out under item 1.4 (techno-economic issues), and review information received and progress in other work carried out under item 1.5 (exchange of information and technology) and make recommendations to the Executive Body for further strengthening implementation and ratification of protocols to the Convention by countries in Eastern Europe, the Caucasus and Central Asia.

### **1.2 Compliance review**

*Description/objectives:* Review of compliance by the Parties with their obligations under the protocols to the Convention.

*Main activities and time schedule:* Any submission or referral made under paragraph 3 (b) of the Implementation Committee's functions (ECE/EB.AIR/53, annex III, annex) will be dealt with as a priority, and the Committee may have to adjust its workplan and time

schedule accordingly. In this regard, the Committee will continue to review the progress made by the Parties in response to decisions taken by the Executive Body based upon the Committee's recommendations, as well as the need for possible additional measures for dealing with non-compliance on a case-by-case basis. The Committee will also evaluate the reporting by Parties on their emission data and their strategies and policies, as well as the content of the questionnaire and the basis on which cases are brought to the Committee. It will continue to review carefully the reporting under the Protocol on Persistent Organic Pollutants in the context of specific referrals. The Committee will continue its dialogue with appropriate bodies and experts. The fifteenth and the sixteenth reports of the Implementation Committee will be submitted to the Executive Body respectively at its thirty-first session in 2012 and its thirty-second session in 2013.

### **1.3 Economic assessment of benefits from air pollution abatement and economic instruments**

*Description/objectives:* To develop further the work on benefits and economic instruments and to enable economic considerations to be taken into account in the discussion/review of the protocols to the Convention.

*Main activities and time schedule:* The Network of Experts on Benefits and Economic Instruments, led by the United Kingdom of Great Britain and Northern Ireland, will provide the framework and expertise for a series of workshops. The Network will meet only on the occasion of planned workshops, preferably in conjunction with meetings organized by the Task Force on Integrated Assessment Modelling and/or the Working Group on Effects. It will include not only economists, but also representatives from other specialist groups and stakeholder organizations such as non-governmental organizations and industry. The Network will assess experiences of Parties in using economic instruments for reducing air pollution and will strengthen the involvement of countries from Eastern Europe, the Caucasus and Central Asia in its activities. It will conduct work pursuant to decision 2010/2.

### **1.4 Techno-economic issues**

*Description/objectives:* To explore further best available techniques (BAT) for emission abatement, including their efficiencies and costs; to continue to develop a techno-economic database (ECODAT) and methodologies for evaluating uncertainties; and to draw up draft revisions of techno-economic items in annexes to protocols.

*Main activities of the Expert Group on Techno-economic Issues:*

*Ongoing activities:* The Expert Group will:

- (a) Continue the work on emerging techniques in combustion plants with a capacity lower than 500 MWth and provide a report by the beginning of 2012;
- (b) Continue the cooperation with the Coordinating Group on the promotion of actions towards implementation of the Convention in Eastern Europe, the Caucasus and Central Asia (Coordinating Group for Eastern Europe, the Caucasus and Central Asia), including:
  - (i) Potential implementation of pilot studies on emission abatement cost assessment for electricity generation and other sectors such as oil, non-ferrous metal industries in countries of the subregion (ongoing project in the Russian Federation on electricity generation and potential projects in other countries);

- (ii) Joint session of the Coordinating Group for Eastern Europe, the Caucasus and Central Asia and the Expert Group within the Atmosphere-2012 Congress (tentatively scheduled for 16–18 April 2012);
- (iii) Projects on translation of relevant documents on techno-economic issues into the Russian language.
- (c) Continue to cooperate with the Centre for Integrated Assessment Modelling (CIAM) to improve quality of the data concerning the electricity production and iron and steel production sectors in the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model;
- (d) Continue to update the methodology developed by the Expert Group for large combustion plants (LCPs) and refineries. Parties are invited to nominate experts for this task;
- (e) Continue to cooperate with the European Integrated Pollution Prevention and Control Bureau, including updating cost data of BAT reference documents for some industry sectors;
- (f) Continue to explore further work on black carbon, in cooperation with other technical bodies of the Convention. The Expert Group will look for experts on mobile sources and other potential major sources of black carbon;
- (g) Continue the cooperation with the Institute for Prospective Technological Studies in Seville;
- (h) Report on progress in the work to the Working Group on Strategies and Review.

*New activities:* The Expert Group on Techno-Economic Issues will explore the application of the Expert Group/GAINS comparison methodology to the countries of Eastern Europe, the Caucasus and Central Asia, and work to develop a guidance document on BAT for reducing emissions of black carbon.

## 1.5 Exchange of information and technology

*Description/objectives:* To create favourable conditions for implementing technology-related obligations of the Convention and its protocols; to facilitate the implementation of existing protocols and the accession of non-Parties, particularly countries with economies in transition.

*Main activities of the Working Group on Strategies and Review:* The Working Group on Strategies and Review will review the implementation of the revised Action Plan to involve the countries of Eastern Europe, the Caucasus and Central Asia in the work of the Convention (ECE/EB.AIR/WG.5/2007/17).

*Main activities of the Coordinating Group for Eastern Europe, the Caucasus and Central Asia:* The Coordinating Group will carry out its work in accordance with decision 2010/17 and report on progress to the Executive Body.

## 1.6 Reactive nitrogen

*Description/objectives:* To develop an integrated approach towards controlling nitrogen pollution in the framework of the Convention, and to improve coordination between the work of various Convention bodies on nitrogen compounds. The activities related to reactive nitrogen are carried out by the Task Force on Reactive Nitrogen.

*Ongoing activities:* The Task Force on Reactive Nitrogen will:

- (a) Continue work on nitrogen emission abatement from agricultural sources, develop technical and scientific information on an integrated approach to mitigation of agricultural nitrogen, and will finalize the update of the Guidance Document on Control Techniques for Preventing and Abating Emissions of Ammonia;
- (b) Continue providing technical information on making and using nitrogen budgets and estimating nitrogen emissions at various spatial scales and for various system boundaries;
- (c) Continue collecting and assessing information from the national focal points regarding their experiences, including any difficulties that they have in developing and implementing an integrated approach;
- (d) Provide technical information on the effects of human diets on nitrogen use and emissions in the form of an informal document to the Executive Body, to allow for the possible mandate for a formal document to be presented to Working Group on Strategies and Review;
- (e) Continue to liaise with CIAM to examine the costs and benefits of ammonia emissions abatement measures;
- (f) Liaise with the countries of Eastern Europe, the Caucasus and Central Asia in the development of approaches for managing reactive nitrogen in industry and agriculture;
- (g) Further disseminate the results from the *European Nitrogen Assessment* and consider the longer-term perspective, in relation to the potential of linking air pollution, water pollution and other environmental threats;
- (h) Consider the vision and future possibilities for integrating nitrogen management within the Convention and in relation to other ECE and international conventions; prepare an informal document on this topic for the Executive Body, to allow for the possible mandate for a formal document to be presented to Working Group on Strategies and Review;

*New activities:* The Task Force on Reactive Nitrogen will:

- (a) Work on updating the Framework Code on Good Agricultural Practice for Reducing Ammonia taking into the relevant European Commission's reference documents on Best Available Techniques (BREFs);
- (b) Develop multi-pollutant approaches when continuing work on nitrogen emission abatement from agricultural sources;
- (c) Look specifically at the farm scale when continuing to provide technical information on making and using nitrogen budgets.

## **1.7 Review and assessment of heavy metals**

*Description/objectives:* To continue the technical work related to the review of the Protocol on Heavy Metals. The activities related to heavy metals are carried out by the Task Force on Heavy Metals.

*Ongoing activities:* The Task Force on Heavy Metals will:

- (a) Following the recommendation of the Working Group on Strategies and Review, review the comments provided by Parties to informal documents Nos. 15 and 16 for the forty-ninth session of the Working Group (draft proposal for a guidance document, former annex III of the Protocol on Heavy Metals, on best available techniques for

controlling emissions of heavy metals and their compounds from the source categories listed in annex II);

(b) Hold a technical workshop, tentatively scheduled to be held in Berlin in February 2012, with the support of Germany, and continue to discuss and update the draft guidance document extracted from annex III of the Protocol on Heavy Metals prior to its submission to the fiftieth session of the Working Group.

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

### **2.1 Emissions**

*Description/objectives:* To further develop emission inventories; to improve the quality, transparency, consistency, completeness and comparability of reported emission and projection data; to support the review of compliance; and to assist Parties with their emission reporting. The Task Force on Emission Inventories and Projections provides a technical forum for sharing information, harmonizing emission factors, establishing methodologies for the evaluation of emission data and projections, and identifying and resolving reporting problems, with a view to harmonizing as far as possible reporting requirements with other bodies, including in particular the United Nations Framework Convention on Climate Change (UNFCCC) and the EU National Emission Ceiling (NEC) Directive. The EMEP Centre on Emission Inventories and Projections (CEIP) collects and archives the data submitted by Parties, develops and maintains the database and tools, and prepares data sets and information for modellers and the Implementation Committee.

*Main activities by the Centre on Emission Inventories and Projections:*

*Ongoing activities:* CEIP will:

(a) Compile revised emission data, update the inventory database and make it available at <http://www.ceip.at/emission-data-webdab> by 16 June each year, and update the database with the late submissions from Parties by 1 December each year;

(b) Review reported national emission data in line with the stage 1 and stage 2 review procedures, with the objective of improving the quality, transparency, consistency, completeness and comparability of reported emission, projection and activity data; produce country-specific stage 1 status reports by 31 March each year and stage 2 synthesis and assessment reports by 31 May each year for data received from Parties (in cooperation with the European Environment Agency (EEA) for the stage 2 review); and publish summary information on stage 1 and stage 2 reviews (EEA), as well as the annual CEIP inventory review reports;

(c) Support implementation of the Guidelines for Reporting Emission Data under the Convention on Long-range Transboundary Air Pollution (the Reporting Guidelines) (ECE/EB.AIR/97) by assisting national inventory experts, with a particular focus on countries in Eastern Europe, the Caucasus and Central Asia, Turkey and South-Eastern Europe;

(d) Provide technical and secretariat support to the stage 3 review process, coordinate the review process, maintain the list of eligible reviewers and set up review teams; make completed review reports available online; and implement the agreed schedule of reviews;

(e) Support the Convention secretariat and the Implementation Committee by providing overviews of emission data reported by Parties to the Protocols by 31 March each year;

(f) Consider further technical improvements to the CEIP data system aimed at providing consistent information in a timely and transparent manner; continue the adaptation of the CEIP emission database and web page to facilitate implementation of the revised Reporting Guidelines (in collaboration with the Task Force on Emission Inventories and Projections); continue to develop the CEIP website with a view to supporting, above all, national inventory experts and modellers; and disseminate information to stakeholders and the public.

*New activities:* CEIP will provide methodological support for national inventory experts to compile inventories for black carbon, with a particular focus on countries in Eastern Europe, the Caucasus and Central Asia, Turkey and South-Eastern Europe (in collaboration with the Task Force).

*Main activities by the EMEP Centre on Emission Inventories and Projections, Meteorological Synthesizing Centre-East (MSC-E) and Meteorological Synthesizing Centre-West (MSC-W):*

*Ongoing activities:* CEIP, MSC-E and MSC-W will:

(a) Elaborate annual (current year -2) data sets of validated and complete emission data by 16 April of each year to be used in the EMEP annual assessments; continue to update historical gridded emissions to achieve consistency with recalculated national submissions; further increase the transparency in the use of non-Party estimates for modelling;

(b) Enhance the dialogue with modelling groups outside the Convention/EMEP (e.g., the Monitoring Atmospheric Composition and Climate (MACC) project, the European Commission Joint Research Centre (JRC), Stuttgart University, the Netherlands Organisation for Applied Scientific Research (TNO) and the European Commission), with a focus on assessing options for sharing information in order to improve the quality of the spatial distribution of emissions used in EMEP models.

*New activities:* CEIP, MSC-E, MSC-W and CIAM will continue exploring the possibility of developing a new gridding system for emission data reporting with the aim of improving the transparency and robustness of gridded data; consider options to grid emissions on a higher resolution (e.g., 0.2° x 0.2°, 0.1° x 0.1°, 20 km x 20 km) and replace the existing EMEP polar stereographic projection with a geographical projection; and explore potential data sources for gap-filling reported emission data.

*Main activities by the Task Force on Emission Inventories and Projections:*

*Ongoing activities:* The Task Force will:

(a) Encourage increased levels of national support for the activities of the Task Force;

(b) Undertake tasks in the maintenance and improvement plan (MIP) for the *EMEP/EEA Air Pollutant Emissions Inventory Guidebook* (Guidebook), as support allows;

(c) Continue to support the stage 2 and 3 review processes by liaising with CEIP;

(d) Continue to liaise with Parties not submitting data or informative inventory reports, to facilitate more complete reporting.

*New activities:* The Task Force will:

- (a) Undertake an assessment of the current knowledge on black carbon, and provide support to the Task Force on Hemispheric Transport of Air Pollution, as resources allow;
- (b) Pursuant to decision 2010/2, work to develop guidelines for black carbon inventories, with a view to making it possible for Parties to begin voluntary reporting of black carbon emissions and projections in the near future;
- (c) Liaise with the EMEP Steering Body Chair regarding possible actions to address the lack of progress in reporting from countries in Eastern Europe, Caucasus and Central Asia;
- (d) Review the extent to which the forthcoming Russian version of the Guidebook is used by countries in Eastern Europe, the Caucasus and Central Asia.

## 2.2 Atmospheric measurements and modelling

*Description/objectives:* To support the implementation of protocols to the Convention; provide the measurement and modelling tools necessary for further abatement policies; to compile and evaluate information on transboundary air pollution; and to implement the EMEP monitoring strategy. The Task Force on Measurements and Modelling reviews and assesses the scientific and operational activities of EMEP related to monitoring and modelling, evaluates their contribution to the effective implementation and further development of the protocols and reviews national activities related to measurement, modelling and data validation. The operational activities of EMEP related to atmospheric monitoring and modelling are carried out by the Chemical Coordinating Centre (CCC), MSC-E and MSC-W.

*Main activities by the Task Force on Measurements and Modelling:*

*Ongoing activities:* The Task Force, supported by CCC, MSC-E and MSC-W, will:

- (a) Build up the appropriate framework and support for the implementation of the updated EMEP monitoring strategy, including:
  - (i) Considering possible synergies with the monitoring requirements of the EU Air Quality Directive;
  - (ii) Developing cooperation with the atmospheric composition research community and the existing operational monitoring networks, especially for short lived climate forcers monitoring (e.g. WMO Global Atmosphere Watch);
- (b) Contribute to the analysis and promotion of the EMEP intensive measurement data; encourage utilization of their results; and invite Parties to use relevant data for national air quality assessments and analyses;
- (c) Contribute to the ongoing EU modelling initiatives, e.g., European Consortium for Modelling of Air Pollution and Climate Strategies (EC4MACS), the EEA Forum for Air Quality Modelling in Europe (FAIRMODE<sup>1</sup>) and the Air Quality Model Evaluation International Initiative (AQMEII).

*New activities:* The Task Force on Measurements and Modelling will:

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<sup>1</sup> See <http://fairmode.ew.eea.europa.eu/>

(a) Contribute to the development and the implementation of the work plan for the next EMEP field campaigns scheduled for summer and winter periods in 2012 and 2013, respectively;

(b) Provide guidance and assistance for the implementation of the six case studies on heavy metal pollution assessment (in the Czech Republic, Croatia, the Netherlands, Spain, Italy, Slovakia), which aims at bringing together the know-how for policy support from emission, measurement and modelling communities; assess and analyse the results and overall success of the exercise;

(c) Organize and coordinate the EURODELTA3 follow-up modelling exercise focusing on the evaluation of the ability of models (especially the EMEP model) to simulate fine resolution atmospheric processes, with the emphasis on the development of common model intercomparison protocols, model-to-observation performance indicators and criteria needed for to evaluation of the state of the art of the EMEP model, as well as its ability to reproduce past trends in air pollutant concentrations;

(d) Organize and coordinate the preparation of a report on achievements within the last 10 years of Air Convention, based on monitoring observation data, modelling results and national expertise. As a first step, a questionnaire to assess the results of the Gothenburg Protocol implementation will be circulated to Parties;

(e) Consider options and opportunities for enhancing the visibility and promotion of the work of the Task Force on Measurement and Modelling (e.g., by means of newsletters, conferences).

*Main activities by the Chemical Coordinating Centre:*

*Ongoing activities:* CCC will:

(a) Review, store and make available EMEP monitoring data for the modelling centres and Parties. Efforts will be made to acquire additional monitoring data from Parties as defined by the monitoring strategy (including short-lived climate forcers and variables to monitor radiative forcing);

(b) Continue efforts to establish near-real-time data access to observations at EMEP sites to support Global Monitoring for the Environment and Security (GMES)/Global Earth Observation System of Systems (GEOSS) implementation, with a major focus on level 2 sites;

(c) Publish the validated annual data and contribute to preparation, review and assessments of observation data presented in the series of EMEP reports;

(d) Provide training/guidance to Parties to establish monitoring activities in compliance with the EMEP monitoring strategy;

(e) Arrange laboratory intercomparisons for main components, heavy metals and elemental carbon/organic carbon (EC/OC) — the latter in cooperation with the JRC and the FP7 EU project Aerosols, Clouds, and Trace gases Research Infrastructure Network (ACTRIS);

(f) Further develop the global database established for hemispheric transport of air pollution, and address global-scale integration of quality assessment/quality control (QA/QC) activities of regional monitoring programmes, including standards for metadata provision and intercomparisons (in collaboration with the Task Force on Hemispheric Transport of Air Pollution);

(g) Maintain close interaction with relevant organizations and bodies in relation to integration of observations, including monitoring efforts under other Convention bodies (e.g., the EMEP International Cooperative Programmes and national monitoring obligations

to European Commission directives, as well as activities undertaken by EEA, the World Meteorological Organization, the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Commission), the Baltic Marine Environment Protection Commission (HELCOM), the United Nations Environment Programme (UNEP), the Arctic Monitoring and Assessment Programme (AMAP), the European Science Foundation Nitrogen in Europe (NinE) Research Networking Programme, GMES/GEOSS and others;

(h) Participate as far as possible in the discussions that are held at the European Commission level within the future revision process of the Air Quality Directive to ensure further harmonization of measured parameters and measurement techniques between the EMEP Monitoring strategy and the EU Directive monitoring requirements.

*New activities:* CCC will:

(a) Improve web interface to the EMEP database to include more statistical opportunities for aggregated data, further develop the plotting routines and develop improved export routines for data download for modellers;

(b) Use integrated data sets from satellite and ground-based remote sensing to support the traditional in situ measurement;

(c) Further evaluate the EMEP intensive data from 2008–2009 to improve the understanding of sources, temporal and spatial variations, with a special focus on ammonia and carbonaceous matter (supported by MSC-W);

(d) Evaluate new measurements data of POPs and EC/OC from Eastern Europe, the Caucasus and Central Asia to assess the relative importance of the different pollutants and the main source regions (supported by MSC-W and MSC-E);

(e) Contribute to the development of standard methods and QA/QC procedures in relation to parameters included in the monitoring requirements of the 2010–2019 monitoring strategy, and update the EMEP manual for sampling and chemical analysis in accordance with those outputs;

(f) Coordinate part of the EMEP intensive monitoring periods scheduled for the summer 2012 and winter 2013 in cooperation with the FP7 EU project ACTRIS (supported by the Task Force on Measurements and Modelling);

(g) Actively engage with the AQUILA network of National Reference Laboratories for air pollution set up by the European Commission, in order to foster a harmonized monitoring approach between the Convention and the EU air policies;

(h) Exchange EMEP monitoring data with EEA for the purposes of Global Monitoring for Environment and Security (GMES) services.

*Main activities by the Meteorological Synthesizing Centre-West on acidification, eutrophication, photo-oxidants and particulate matter (PM):*

*Ongoing activities:* MSC-W will:

(a) Further develop the Unified EMEP Model code to ensure that it is kept state of the art, and release an updated version of the open source code online, including documentation of model changes and the effect on the results;

(b) Prepare and process meteorological data for 2010–2011;

(c) Process and prepare emission data (model input) for 2010–2011 (supported by CEIP);

(d) Calculate photochemical compounds, sulphur, nitrogen, PM air concentrations and deposition fields and source-receptor matrices for the extended EMEP area for 2010–2011;

(e) Calculate indicators for health (SOMO35) and ecosystem damage (exceedances of critical loads), and ozone (O<sub>3</sub>) fluxes to forest and crops (supported by the Coordination Centre for Effects (CCE));

(f) Evaluate modelling results against EMEP measurements for 2010–2011 using standardized matrix, indicators and criteria for the assessment of model performance (supported by CCC);

(g) Prepare individual country reports and make results of model and trajectory calculations available online for use by Parties;

(h) Contribute to the work of the subsidiary bodies and task forces by reporting on the results and on the research activities and developments;

(i) Cooperate with AMAP, HELCOM, the OSPAR Commission and national experts.

*New activities:* MSC-W will:

(a) Prepare the model for status runs on finer resolution (~0.2° or finer) including pre-processing of meteorology, model input data, parameters and emissions. Deliver status runs in 2012 on 50 kilometre (km) and finer resolutions. Use AEROCOM (aerosol comparison) tools for additional model evaluation;

(b) Continue development of the EMEP model's secondary organic aerosols (SOA) module:

(i) Based on new measurements available from the European integrated projection aerosol cloud climate air quality interactions (EUCAARI) project and EMEP data;

(ii) Evaluate biogenic volatile organic compound (BVOC) emissions, which underpin SOA modelling, through comparison with available BVOC data and with satellite-derived formaldehyde (HCHO) columns;

(c) Implement methods of dealing with sub-grid variability and near-canopy chemistry to improve estimates of ecosystem exchanges and the effects of climate change on EMEP model predictions;

(d) With respect to air quality-climate interactions:

(i) Perform source-receptor studies for short-lived climate forcers, based on new emission data and measurement data;

(ii) Estimate and analyse climate change impacts on aerosol concentrations using a climate model (NorESM);

(iii) Analyse changes in transport of European emissions to the Arctic due to climate change using regional downscaled climate data;

(e) Implement improved ship emissions and other transport emissions (also on finer resolution) and analyse the effect on air quality;

(f) Make further use of the data from the EMEP intensive measurement periods to improve the model, especially processes related to secondary inorganic aerosols (SIA) and mineral dust;

(g) With respect to global model development:

- (i) Refine washout parameterization;
- (ii) Improve biogenic emission modules (nitrogen oxide (NO), BVOC);
- (iii) Evaluate model against non-European sites.

*Main annual activities by the Meteorological Synthesizing Centre-East:*

*Ongoing activities:* MSC-E will evaluate air concentrations, deposition fluxes and transboundary atmospheric transport of heavy metals (lead (Pb), cadmium (Cd) and mercury (Hg)) and POPs (polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-*p*-dioxins and dibenzofurans (PCDD/Fs), and hexachlorobenzene (HCB) for 2010-2011, and in particular will:

- (a) Calculate heavy metal and POP dispersion on a global scale with the help of the global EMEP model (GLEMOS) for the evaluation of initial and boundary conditions and contributions of intercontinental transport to pollution levels in the EMEP domain and in remote regions (the Arctic) with a spatial resolution  $1^\circ \times 1^\circ$ ;
- (b) Perform model assessment of transboundary pollution within the EMEP region by heavy metals and POPs for 2010–2011 including contamination of marginal seas with spatial resolution of 50 km x 50 km;
- (c) Perform detailed analysis of heavy metal pollution levels with finer spatial resolution (5 km x 5 km, 10 km x 10 km) for countries participants of the case study for the improvement of quality of heavy metal pollution assessment on country's and EMEP scales (e.g., the Czech Republic, Croatia, the Netherlands and Spain);
- (d) Prepare input data required for global/regional/local modelling (emission, meteorological and geophysical data);
- (e) Contribute to the air pollutant effects community work with information on ecosystem-dependent deposition fluxes of heavy metals and POPs to different land use types to support evaluation of the pollutants adverse effect on human health and the environment;
- (f) Support countries with information required for air quality management in and implementation of the Convention's Protocols on heavy metals and POPs, with special emphasis on countries in Eastern Europe, the Caucasus and Central Asia;
- (g) Cooperate with the subsidiary bodies to the Convention (the Working Group on Strategies and Review and the Working Group on Effects), EMEP task forces (on hemispheric transport of air pollution and on measurements and modelling), and relevant international organizations.

*New activities:* MSC-E will:

- (a) With respect to global/regional/local modelling:
  - (i) Further develop and improve the modular architecture of the GLEMOS modelling framework, including adaptation and testing of the nesting procedure for multiscale simulations and improvement of the framework computational efficiency;
  - (ii) Incorporate data on aerosols and atmospheric reactants based on external data sets or simplified chemical modules for improving evaluation of heavy metal and POP pollution levels;
  - (iii) Continue model development of wind re-suspension of heavy metals from terrestrial and aquatic surfaces and investigation of its role in heavy metal pollution, both on regional and country scales;

- (iv) Perform comprehensive analysis of major physical and chemical processes governing mercury cycling in the atmosphere based on sensitivity study and evaluation against detailed measurements (in cooperation with the EU GMOS project);
- (v) Further develop and test the integrated monitoring/modelling/emission approach for heavy metals and POPs, including adjoint modelling;
- (vi) Prepare the GLEMOS modelling framework for distribution and support as an open source software;
- (b) With respect to the EMEP case study:
  - (i) Carry out integrated analysis of heavy metal pollution levels in the Czech Republic, perform improved assessment of the country pollution including evaluation of contribution of major emission sources;
  - (ii) Evaluate factors affecting pollution levels in Croatia, the Netherlands and Spain on the basis of emissions, measurements and modelling results with fine spatial resolution, and involvement of country-specific input data provided by country-participants;
  - (iii) Initiate model assessment of POP pollution on a country scale;
- (c) with respect to climate change impact on POP long-range transport and fate:
  - (i) Evaluate sensitivity of POP contamination to variation of meteorological parameters, atmospheric constituents (aerosols, reactants), and environmental factors influenced by climate change;
  - (ii) Perform modelling of climate change effects on POP transport and fate for selected periods using climate change scenarios data.

## 2.3 Integrated assessment modelling

*Description/objectives:* To analyse scenarios on cost-effective reduction of acidification, eutrophication, tropospheric ozone, PM exposure and short-term regional radiative forcing. Modelling will cover: (a) abatement options for reducing sulphur, nitrogen oxides, ammonia, non-methane volatile organic compounds (NMVOCs), methane, primary PM, organic and black carbon and carbon monoxide, including structural measures in energy, transport and agriculture, as well as their costs; (b) projections of emissions; (c) assessments of the atmospheric transport of substances; and (d) analysis and quantification of environmental and health effects and benefits of emission reductions. The Task Force on Integrated Assessment Modelling will guide the work of CIAM and will encourage and support national modelling activities by its National Focal Points.

*Main activities by the Centre on Integrated Assessment Modelling:*

*Ongoing activities:* CIAM will:

- (a) Support the revision of the Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) via analyses of policy strategies, as requested by the Working Group on Strategies and Review and pursuant to decision 2010/2;
- (b) Carry out sensitivity analyses and report on the robustness of modelling results to the Task Force on Integrated Assessment Modelling.

*New activities:* CIAM will continue the development of the GAINS modelling framework for the purpose of estimating co-benefits of air pollution abatement strategies to reduce ozone and PM for radiative forcing and black carbon deposition in the Arctic.

*Main activities by the Task Force for Integrated Assessment Modelling:*

*Ongoing activities:* The Task Force will:

- (a) Support negotiations on a revised Gothenburg Protocol by making available results of model calculations made at the request of the Working Group on Strategies and Review and produce a background report that can be used as reference in a future review of the revised Gothenburg Protocol and in implementation discussions;
- (b) Support countries in Eastern Europe, the Caucasus and Central Asia and west Balkan countries in using GAINS;
- (c) Offer a platform for exchange of experiences with national and local integrated assessment modellers, linking European models with national and local models.

*New activities:* The Task Force will:

- (a) Prepare for future review the revised Gothenburg Protocol, defining what scenario indicators should be monitored;
- (b) Guide the further development in integrated assessment model at CIAM, e.g., in including black carbon and other short-lived climate forcers, exploring synergies with climate policy, effects on biodiversity and carbon sequestration and in improved modelling of the effects of exposure to PM compounds on health and the definition of health-relevant abatement measures;
- (c) Explore possibilities to assess synergies between PM-abatement and the abatement of heavy metals and POPs;
- (d) Assess abatement strategies at a broader scale than the current EMEP-modelling domain, in cooperation with the Task Force on Hemispheric Transport of Air Pollution.

## 2.4 Hemispheric transport of air pollution

*Description/objectives:* To develop a fuller scientific understanding of the intercontinental transport of air pollution across the Northern Hemisphere; its impacts on health, ecosystems, and climate; and the linkages between regional air pollution and global change. The Task Force on Hemispheric Transport of Air Pollution coordinates activities, including collaboration with other international bodies, programmes and networks, both within and outside the UNECE region, with related interests. The Task Force has identified a set of policy-relevant questions to guide the technical work in this area and has organized activities around six themes, which are described further in the co-Chair's 2011 report (ECE/EB.AIR/GE.1/2011/7).

*Ongoing activities:* Activities that continue or build upon past efforts will include:

- (a) Continued development of the EMEP centres' global modelling framework;
- (b) Further analyses of the information collected in *HTAP 2010*<sup>2</sup> and the multi-model experiments conducted for years 2001 and 2004;

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<sup>2</sup> UNECE Hemispheric Transport of Air Pollution 2010.

(c) Further exploration of the parameterization of intercontinental source/receptor relationships to generate policy-relevant insights;

(d) Maintenance of the Hemispheric Transport of Air Pollution (HTAP) Modelling Data Server (FZ Juelich) and the (EBAS-HTAP) observational data set (observation data of atmospheric chemical composition and physical properties at Norwegian Institute for Air Research - NILU) and their data access web services.

*New activities:* anticipated activities in 2012–2013 that are new developments include:

(a) Extension of EDGAR-HTAP emissions inventory to 2006–2008;

(b) Multi-model simulations for 2006–2008 and initial evaluations with observational data sets;

(c) Evaluation of the impacts on air quality of emissions abatement scenarios for the period 2020 to 2050, with results available by mid-2013;

(d) Multi-model simulations for assessing regional boundary conditions, source attribution and source-receptor sensitivities under future abatement scenarios, with initial results available by mid-2013;

(e) Expansion of the distributed data network and the available analysis tools for model, observation and emissions visualization and comparison;

(f) Exploration of alternative techniques for characterizing source attribution and source/receptor sensitivities;

(g) Analysis of insights from other efforts (e.g. AC&C-Hindcast experiments of Aerosol Comparisons between Observations and Models (AEROCOM) and Atmospheric Chemistry and Climate Model Intercomparison Project (ACCMIP)) regarding the impacts of climate change on pollution transport;

(h) Review of methodologies for assessment of impacts of intercontinental transport on health, ecosystems and climate;

(i) Publication of targeted reports on selected issues above.

Activities in 2014–2015 may include:

(a) Improved quantification of model uncertainties based on evaluations with integrated observational data sets;

(b) Comparison of alternative measures of source attribution and source/receptor sensitivity under future abatement scenarios;

(c) Improved assessment of health, ecosystem and climate impacts of intercontinental transport;

(d) Improved assessments of source attribution and source/receptor sensitivity under scenarios of climate change;

(e) Publication of targeted reports on selected issues above.

### **3. Effects of major air pollutants on human health and the environment**

#### **3.1 Review of effects of major air pollutants**

*Description/objectives:* Annual review of activities and results of the International Cooperative Programmes (ICPs) and the Task Force on the Health Aspects of Air Pollution (Task Force on Health) under the Working Group on Effects. The ICPs and the Task Force on Health provide appropriate reports to the sessions of the Executive Body on the reviews and revisions of the Convention's protocols.

*Ongoing activities:* the ICPs and the Task Force on the Health will:

- (a) Submit relevant information and reports to the secretariat, in particular contributions to the revision of the Gothenburg and Heavy Metals Protocols;
- (b) Submit results to the secretariat for the annual joint report of the ICPs, the Task Force on Health and the Joint Expert Group on Dynamic Modelling;
- (c) Submit appropriate reports to the sessions of the Working Group on Effects and the Executive Body;
- (d) Submit reports on the activities common to all ICPs, the Task Force on Health and the Joint Expert Group on Dynamic Modelling, namely:
  - (i) Report on the further implementation of the Guidelines on Reporting of Monitoring and Modelling of Air Pollution Effects;
  - (ii) Final version of the report on impact analysis by the Working Group on Effects;
  - (iii) Report on ideas and actions to enhance the involvement of EECCA/SEE countries in the Eastern Europe, the Caucasus and Central Asia and on cooperation with activities outside the Air convention;
  - (iv) Report on biodiversity and ecosystems services.

#### **3.2 International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments**

*Description/objectives:* Quantification of the multi-pollutant effects on the corrosion and soiling of selected materials under different environmental conditions, inter alia, as a basis for economic evaluation of air pollution damage. A Programme Task Force, in cooperation with the Programme's main research centre, is responsible for the detailed planning and coordination of the Programme.

*Ongoing activities:* The Programme Task Force will elaborate:

- (a) An updated report on trends in pollution, corrosion and soiling;
- (b) An updated report on the pilot study on inventory and condition of stock of materials at risk at United Nations Educational, Scientific and Cultural Organization (UNESCO) cultural heritage sites.

*New activities:* The Programme Task Force will:

- (a) Conduct work pursuant to decision 2010/2;

- (b) Elaborate report on the effect of black carbon on soiling of materials (in 2012);
- (c) Elaborate report on exposure of modern glass 2008-2012 and soiling dose-response functions (in 2013).

### **3.3 International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes**

*Description/objectives:* Identification of the state of surface water ecosystems and their long-term changes with respect to the regional variation and impact of selected air pollutants, and including effects on biota. A Programme Task Force, which also provides the Programme's centre, is responsible for the detailed planning and coordination of the Programme.

*Ongoing activities:* The Programme Task Force will elaborate:

- (a) An updated report on recovery from acidification, trends in surface water chemistry and biology up to 2011;
- (b) An updated report on air pollution effects on aquatic biodiversity.

*New activities:* The Programme Task Force will conduct work pursuant to decision 2010/2.

### **3.4 International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests**

*Description/objectives:* Collection and assessment of comprehensive and comparable data on changes in forests under actual environmental conditions (in particular, air pollution, including acidifying and eutrophying deposition as well as other stresses), and the determination of cause-effect relationships. A Programme Task Force, in cooperation with the Programme's main coordinating centre, is responsible for the detailed planning and coordination of the Programme. Extensive large-scale monitoring (level I), intensive monitoring of forest ecosystems on the permanent sample plots (level II) and integrated evaluation of results is carried out by the Programme Task Force.

*Ongoing activities:* The Programme Task Force will elaborate:

- (a) An updated report on forest soil condition at European scale;
- (b) An updated report on relationships between exceedance of critical limits and forest vegetation response;
- (c) An updated report on development of forest biodiversity under different deposition scenarios.

*New activities:* The Programme Task Force will conduct work pursuant to decision 2010/2.

### **3.5 International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops**

*Description/objectives:* Evaluate the effects of air pollutants and other stresses on (semi-) natural vegetation and crops. For ozone: produce dose-response functions; further develop the flux-based approach for setting critical levels for vegetation; assess economic losses for crops; and evaluate (semi-)natural vegetation and crops as indicators of potential damage to ecosystems, including impacts on ecosystem services and links to climate change. Evaluate

and map heavy metal and nitrogen deposition to vegetation. Evaluate the impacts of nutrient nitrogen on (semi-)natural vegetation. A Programme Task Force, with the cooperation of the Programme's coordination centre, is responsible for the detailed planning and coordination of the Programme.

*Ongoing activities:* The Programme's coordination centre will elaborate:

- (a) An annual report on supporting evidence for ozone impacts on vegetation;
- (b) An annual progress report on European heavy metals and nitrogen in mosses survey 2010/11;
- (c) A report on the relationship between (i) heavy metal and (ii) nitrogen concentrations in mosses and their impacts on ecosystems.

*New activities:* The Programme's coordination centre will:

- (a) Elaborate a report on ozone, carbon sequestration, and linkages between ozone and climate change;
- (b) Elaborate a report on ozone impacts on biodiversity and ecosystem services;
- (c) Elaborate a report on the pilot study of mosses as biomonitors of POPs, and also will;
- (d) Conduct work on pursuant to decision 2010/2.

### **3.6 International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems**

*Description/objectives:* Determination and prediction of the state of ecosystems and their long-term changes with respect to the regional variation and impact of selected air pollutants, with special attention to effects on biota. A Programme Task Force is responsible for planning, coordinating and evaluating the Programme. The Programme's centre is entrusted with collecting, storing, processing and analysing data from countries taking part in the Programme.

*Ongoing activities:* The Programme's centre will elaborate an updated report on mass balances for sulphur and nitrogen.

*New activities:* The programme's centre will:

- (a) Conduct work pursuant to decision 2010/2;
- (b) Elaborate a report on relations between biodiversity and CL-exceedances;
- (c) Progress report on base line heavy metal approach.

### **3.7 International Cooperative Programme on Modelling and Mapping of Critical Loads and Levels and Air Pollution Effects, Risks and Trends**

*Description/objectives:* Determine critical loads and levels and their exceedance for selected pollutants. Develop and apply other methods for effects-based approaches, such as dynamic modelling. Model and map the present and projected status of and trends in impacts of air pollution. A Programme Task Force is responsible for the detailed planning and coordination of activities. The Task Force uses available and accepted data, drawing on the work of other task forces, ICPs and EMEP. The Coordination Centre for Effects provides scientific and technical support to the Task Force and to other effects-related activities. It develops methods and models for calculating critical loads and levels and for

other effects-based approaches, and produces maps of critical loads and levels and their exceedance and other risk parameters related to potential damage and recovery.

*Ongoing activities:* The Coordination Centre for Effects will elaborate:

- (a) Report on the scenario analysis for the Thematic Strategy on Air Pollution and the Gothenburg Protocol (2011–2013); updated report on the development and implementation of modelling and mapping methodologies in ex post integrated assessment modelling;
- (b) A call for National Focal Centres (NFCs) reports of contributions to dynamic modelling of vegetation changes and tentative applications by NFCs and CCE of dynamic modelling of vegetation changes at regional scale.

*New activities:* The Coordination Centre for Effects will:

- (a) Conduct work pursuant to decision 2010/2;
- (b) Progress on identification and use of biodiversity endpoints and indicators. Preliminary testing at European scale;
- (c) Foster collaboration between NFCs, CCE, habitat experts and the European Topic Centre (ETC) for biodiversity for reporting on air pollution effects on protected areas and in particular on N effects on protected areas under Article 17 of Habitat directive for EU countries;
- (d) Contribute to the EMEP-Working Group on Effects reporting on the assessment of the Gothenburg Protocol.

### **3.8 Effects of air pollutants on human health**

*Description/objectives:* Preparation of state-of-the-art reports on the direct and indirect effects of long-range transboundary air pollution on human health. The World Health Organization (WHO) is invited to present relevant progress and technical reports to the Working Group on Effects, so that knowledge acquired by WHO can be applied in the further implementation of the Convention. Additional information/reports should be provided, when appropriate, by other international organizations, interested Governments and/or other subsidiary bodies under the Convention. To support the Working Group on Effects and the Executive Body in preparing and substantiating new and/or updating existing protocols, the joint Task Force of WHO/the European Centre for Environment and Health (ECEH) and the Executive Body, led by the WHO/ECEH Bonn Office, evaluates and assesses the health effects of long-range transboundary air pollution and reports on the subject.

*Ongoing activities:* The Task Force will elaborate:

- (a) Update of evidence on health impacts of ozone and PM (including black carbon);
- (b) Update of methods for quantification of health burden of air pollution;
- (c) Harmonization of "scales" facilitating communication on air pollution health effects.

*New activities:* the Task Force will conduct work pursuant to decision 2010/2.

### 3.9 Dynamic modelling

*Description/objectives:* Recovery of ecosystems is an important consideration for the development of air pollution strategies, and work on various ecosystems at different scales is carried out by several ICPs. The Joint Expert Group on Dynamic Modelling brings together experts from these programmes to share knowledge and produce joint reports on all aspects of dynamic modelling.

*Ongoing activities:* The Joint Expert Group will elaborate:

- (a) An annual report on progress in dynamic modelling of acidification and nutrient nitrogen, including the interactions between climate change, air pollution and biological responses;
  - (b) A report of the annual meeting of the Joint Expert Group to the annual session of the Working Group on Effects.
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