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

### Working Group on Effects

#### Thirty-third session

Geneva, 17–19 September 2014

## Report of the Working Group on Effects on its thirty-third session

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## I. Introduction

1. The Working Group on Effects under the United Nations Economic Commission for Europe (ECE) Convention on Long-range Transboundary Air Pollution held its thirty-third session from 17 to 19 September 2014 in Geneva, Switzerland. In accordance with the decision of the Executive Body for the Convention at its thirty-second session (Geneva, 9–13 December 2013), the Working Group held its meeting back to back with the thirty-eighth session of the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) (Geneva, 15–17 September 2014), with a joint session of the two bodies on 17 September (see ECE/EB.AIR/122, para. 47 (b)). Where information relevant to the joint sessions of the two bodies has already been published in the Steering Body's meeting report (ECE/EB.AIR/GE.1/2014/2),<sup>1</sup> the present report makes reference to the relevant paragraphs of that report.

### A. Attendance

2. The session was attended by representatives of the following Parties to the Convention: Albania, Armenia, Austria, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, European Union (EU), Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Montenegro, Netherlands, Norway, Poland, Republic of Moldova, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Ukraine, United Kingdom of Great Britain and Northern Ireland and the United States of America. A delegate from Uzbekistan also attended the meeting.

3. Representatives of the Coordination Centre for Effects (CCE), the Convention's International Cooperative Programmes (ICPs) and their Programme Centres, the Joint Expert Group on Dynamic Modelling and the Joint Task Force on the Health Aspects of Air Pollution (Task Force on Health), as well as the Chairs of the Executive Body, the Working Group on Strategies and Review and the EMEP Steering Body, also attended.

4. In addition, the meeting was attended by representatives of the Environmental Science for European Refining Industry (CONCAWE), the United Nations Environment Programme Regional Resource Center for Asia and the Pacific, the World Health Organization (WHO) European Centre for Environment and the World Meteorological Organization.

### B. Organizational matters

5. Mr. Peringe Grennfelt (Sweden) chaired the meeting.

6. The provisional agenda (ECE/EB.AIR/WG.1/2014/1) was adopted, as amended.

7. The Working Group adopted the report of its thirty-second session (ECE/EB.AIR/WG.1/2013/2).

8. Following elections, Mr. Grennfelt was re-elected Chair for a one-year term of office. Ms. Sabine Augustin (Switzerland), Mr. Jesper Bak (Denmark), Ms. Gudrun

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<sup>1</sup> Available from <http://www.unece.org/index.php?id=33285#/>.

Schuetze (Germany) and Ms. Sonja Vidič (Croatia) were re-elected as Vice-Chairs for a two-year term of office. Mr. Thomas Dirnböck (Austria), Ms. Isaura Rabago (Spain) and Mr. Nebojsa Redzic (Serbia) were elected as new Vice-Chairs, also for a two-year term.

## **II. Matters arising from recent meetings of the Executive Body and its subsidiary bodies<sup>2</sup>**

9. The Chair of the Working Group on Strategies and Review presented the highlights of the fifty-second session of the Working Group (Geneva, 30 June–3 July 2014). Instead of filling in the questionnaire on policies and measures, for the first time, Parties had given presentations at the meeting on their implementation of measures to reduce air pollution. It had been a very productive part of the session. Another important activity had been a joint session on transport organized with the ECE Transport and Housing and Land Management Divisions. The Working Group had decided consider other topics in a similar format at its next sessions. The Task Force on Reactive Nitrogen had also presented a draft framework code on agricultural practices (ECE/EB.AIR/2014/8) and had requested comments from Parties. The final draft would be submitted to the Executive Body for its consideration and adoption at its thirty-third session (Geneva, 8–12 December 2014).

10. The secretariat presented the main outcomes of the thirty-second session of the Executive Body for the Convention (Geneva, 9–13 December 2013) of relevance to the Working Group on Effects. As of 2015 the Steering Body to EMEP and the Working Group on Effects as well as their Extended Bureaux would hold joint meetings. The joint outcome of the work by the two scientific bodies of the Convention would be forwarded to the Working Group on Strategies and Review and then to the Executive Body. This should improve the information flow from scientific bodies to policy level. In that connection, the 2014–2015 workplan for the implementation of the Convention (ECE/EB.AIR/122/Add.2) was much more oriented towards outcomes and deliverables, with identification of funding sources for particular activities. The emphasis for the scientific bodies would be to come up with joint outcomes and policy-oriented messages calling for actions by Parties.

11. The Chair of the Steering Body then presented a brief summary of the outcomes of the thirty-eighth session of the Steering Body. The EMEP centres and the task forces had reported significant progress on the implementation of the 2014–2015 workplan for the implementation of the Convention (ECE/EB.AIR/122/Add.2). A new and important element of the session had been a discussion on the outcome of the analyses of requests by Parties for adjustments under the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol). Several Parties had presented their achievements and challenges in implementing EMEP on a national scale.

## **III. Joint session of the Steering Body and the Working Group on Effects<sup>3</sup>**

12. The main objectives of the joint session of the Steering Body to EMEP and the Working Group on Effects were to discuss:

(a) The objectives, content and targeted audience of the Convention Assessment Report 2016 (2014–2015 workplan, item 1.9);

<sup>2</sup> Paragraphs 9 and 10 correspond to paragraphs 8 and 9 of the EMEP Steering Body report.

<sup>3</sup> This section corresponds to paras. 44–50 of the EMEP Steering Body report.

- (b) Planned long-term trends analyses by EMEP and the Working Group;
- (c) Other activities of common interest for EMEP and the Working Group.

Eleven presentations (see ECE/EB.AIR/GE.1/2014/2, annex) were made by representatives of the two subsidiary bodies.

13. A representative of the Meteorological Synthesizing Centre-West (MSC-W), presenting the plan for the Assessment Report, noted that it should be prepared in support of policy and should include achievements, future challenges and possible benefits from climate policies. The report should, in general, be based on already available material within the Convention. The next step in the report's preparation would be a start-up workshop for approximately 25 participants in Oslo in the beginning of 2015. The outcome of the workshop would be a detailed outline of the report, a plan for contributions from Convention Centres and others, and a time plan. Examples of possible contributions were then given by the Chair of the Task Force on Integrated Assessment Modelling (on integrated assessments), the Head of CCE (on impacts), a co-Chair of the Task Force on Hemispheric Transport of Air Pollution (on the influence from hemispheric air pollution) and the Head of the Centre on Emission Inventories and Projections (CEIP) and a co-Chair of the Task Force on Emission Inventories and Projections (on emissions).

14. In the following discussion, several Parties pointed to the need to have a focus on future control of air pollution under the Convention, and not to spend too much time on past achievements. Questions were also raised as to whether there should be two separate reports or if the scientific and the policy parts should go into one report. It was also pointed out that the workshop invitation should include policy representatives (e.g., members of the Bureau of the Working Group on Strategies and Review) and that the editorial committee should include at least one representative from policy. It was also proposed that the report should be reviewed by the EMEP Steering Body and the Working Group on Effects at their joint meeting in September 2015 and by the Working Group on Strategies and Review in December 2015. The Chair thanked participants for the comments and assured them that the suggestions would be taken into account in the future planning.

15. The Chair of Task Force on Measurements and Modelling informed the Steering Body about the planned analysis of long-term (20-year) trends in atmospheric measurements and modelling. The main objective of the analysis would be the evaluation of impacts of the implementation of the Convention's (emission reduction) protocols on air pollution concentrations, depositions and impacts. The analysis would cover the key pollutants targeted by the three most recent protocols. A preparatory workshop would be organized by the Task Force in Paris on 17 and 18 November 2014. The analysis should be finalized in the form a report and a contribution to the Assessment Report by December 2015.

16. The Head of the Programme Centre of the International Cooperative Programme on Assessment and Monitoring of the Effects of Air Pollution on Rivers and Lakes (ICP Waters) reported on the initiative among the ICPs and the Joint Task Force on the Health Effects of Air Pollution to produce a report focusing on long-term trends in ecosystems effects. All ICPs had accumulated long-term data series on effects of air pollution with large regional coverage and had carried out periodic trend assessments.

17. The Working Group on Effects welcomed the initiatives of EMEP and the ICPs to carry out the long-term trend analysis, and encouraged the EMEP and Working Group on Effects communities to continue to exchange views on the issue and to explore the possibility of coordinating that work.

18. Representatives of EMEP (CEIP, the Task Force on Emission Inventories and Projections and MSC-W) reported, inter alia, on the progress of emissions and modelling-

related work on the new EMEP grid with finer spatial resolution. The modelling of air pollutant concentrations and depositions in the finer grid might significantly affect the effects-oriented work under the Working Group on Effects. It was agreed that EMEP and the Working Group on Effects should work close together in order to analyse the consequences of the increased grid resolution of the EMEP model and to communicate to each other and to the Parties, if considerable changes in critical loads exceedances were detected.

#### **IV. Progress in activities in 2014 and further development of effects-oriented activities**

19. The Chair of the Working Group introduced the 2014 joint report by the ICPs and the Task Force on the Health (ECE/EB.AIR/WG.1/2014/3). The joint report was a compilation of the main messages from all activities carried out by the ICPs. The Working Group endorsed the report and decided to forward it to the Executive Body for its consideration at its thirty-third session (Geneva, 8–11 December 2014).

20. The Chairs or representatives from the lead countries or coordination centres of each of the ICPs presented their recent and planned activities, information on events, including task force meetings, key achievements and recent publications.

21. A representative of the ICP on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) Programme Centre summarized the results presented at the thirtieth meeting of the ICP Forests Task Force (Athens, Greece, 28–30 May 2014), which had been attended by 52 delegates from 24 countries. Standard evaluation routines as well as more integrated evaluations of the data collected following the ICP Forests Manual<sup>4</sup> were still in progress. Data management continued to be high priority and funds were sought for that work, among others, by applying to the EU in the framework of the Horizon 2020 call for proposals<sup>5</sup> on the further development of data infrastructures. In that context, data quality control and assurance at different levels were still given high priority. The third scientific conference of ICP Forests, held back to back with the Task Force meeting (26–28 May 2015), had focused on the effects of nitrogen deposition and ozone impacts on forest ecosystems or their components. In 2014, a special issue of the journal *Forest Ecology and Management*<sup>6</sup> had been published based on presentations at the first ICP Forests scientific conference. In total, 42 scientific papers had been published in 2013 and in the first half of 2014, 13 of which had been highlighted in the main findings, mostly reflecting activities in accordance with the 2014–2015 workplan.

22. The Working Group:

(a) Took note of the results of ICP Forests, especially those on nitrogen deposition and sensitive parts of forest ecosystems;

(b) Recommended that the evaluations on the effects and long-term impacts of nitrogen deposition on forests be continued;

(c) Encouraged ICP Forests to intensify its cooperation with other ICPs, especially with the ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems (ICP Integrated Monitoring), ICP Waters and the ICP on Modelling and Mapping of

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<sup>4</sup> See <http://icp-forests.net/page/icp-forests-manual>.

<sup>5</sup> See <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/>.

<sup>6</sup> See <http://www.journals.elsevier.com/forest-ecology-and-management>.

Critical Levels and Loads and Air Pollution Effects, Risks and Trends (ICP Modelling and Mapping).

23. The Head of the Programme Centre of ICP Waters gave an overview of the results presented at the twenty-ninth meeting of the ICP Waters Task Force (Cesky Krumlov, Czech Republic, 1–3 October 2013), in particular regarding the ongoing trend analysis of chemistry and biology. The trend analysis had been carried out in cooperation with ICP Integrated Monitoring and had covered data from almost 200 sites in Europe and North America. The analysis involved the calculation of trends in water chemistry for 2000–2012, the calculation of water chemistry for the same period with a steady state model, and a prognosis of future water chemistry given commonly used deposition scenarios delivered by CCE. Only preliminary results had been presented at the meeting, but the results were expected to highlight the effects of climate change on chemical recovery. The final results would be presented at the next ICP Waters Task Force meeting (14–16 October 2014). Additionally, the planned work on biodiversity and climate for 2015 had been presented.

24. The Working Group:

(a) Took note of the preliminary results of ICP Waters on the trend analysis of water chemistry;

(b) Noted that climate change might delay chemical recovery, and consequently biological recovery, of surface waters.

25. The Chair of the ICP on Effects of Air Pollution on Materials, including Historic and Cultural Monuments (ICP Materials) outlined the results presented at the thirtieth meeting of the ICP Materials Task Force (Stockholm, Sweden, 23–25 April 2014), including the upcoming exposure for trend analysis 2014–2015 with the addition of sites from three new countries: Estonia, Finland and Slovakia. He focused on policy-relevant questions related to the trends in pollution, corrosion and soiling over the period 1987–2012, which, *inter alia*, showed that corrosion had decreased by around 50 per cent of the original values measured in 1987. In recent years, however, the improvements in corrosion and soiling had been minor. For real cultural heritage objects made of metals the decreases had been instantaneous, with the metals materials responding rapidly to decreasing pollution levels. For stone materials, however, there had been a substantial time lag of 20 years or more, before improvements could be seen. The ICP Chair also gave a progress report on the preparation of a call for data on inventory and condition of stock materials at United Nations Educational, Scientific and Cultural Organization (UNESCO) cultural heritage sites, which included the preparation of a draft template for reporting.

26. The Working Group:

(a) Noted the results of ICP Materials work on trends in corrosion and soiling 1987–2012, which had focused on policy-relevant questions related to improvements, main pollutants responsible for the corrosion, dose-response functions, climate change and use of EMEP data;

(b) Encouraged ICP Materials to continue its plan for issuing a call for data on inventory and condition of stock materials at UNESCO cultural heritage sites.

27. The Chair of the ICP on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation) informed the Working Group about the decisions and recommendations from the twenty-seventh meeting of the ICP Vegetation Task Force and one-day ozone workshop (Paris, France, 28–30 January 2014). Workplan items delivered in 2014, included: (a) the revision of chapter 3 (Mapping critical levels for vegetation), of the

*Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends*<sup>7</sup> (Modelling and Mapping Manual), particularly the simplified ozone flux-effect relationship and critical level for crops developed for application in integrated assessment modelling at the European scale; (b) a study on the deposition of air pollution to vegetation and their impacts in countries of Eastern and South-Eastern Europe, the Caucasus and Central and South-East Asia; (c) development of a new smart-phone application for recording incidences of ozone injury on vegetation and a brochure on ozone injury symptoms; (d) outreach to Asia by co-organizing the Conference on Ozone and Plants (Beijing, China, 18–21 May 2014); and (e) collaboration with other bodies within the Convention. The head of the new Moss Survey Coordination Centre from the Joint Institute for Nuclear Research (Dubna, Russian Federation) also reported on progress with preparations for the next moss survey in 2015/16 (monitoring heavy metal, nitrogen, persistent organic pollutants and radionuclides), emphasizing the increased interest from countries in Eastern Europe, the Caucasus and Central Asia and other countries in Asia in participating in the survey.

28. The Working Group:

(a) Took note of the technical report from ICP Vegetation (ECE/EB.AIR/WG.1/2014/8) and the revision of chapter 3 of the Modelling and Mapping Manual, particularly the simplified ozone flux model for crops for application in integrated assessment modelling at the European scale;

(b) Took note with appreciation of the successful transfer of the coordination of moss surveys to the Russian Federation and the translation of ICP Vegetation documentation into Russian;

(c) Approved the report on the deposition of air pollutants to vegetation in Eastern and South-Eastern Europe, the Caucasus and Central and South-East Asia and their impacts (ECE/EB.AIR/WG.1/2014/13), with minor amendments, and decided to forward it to the Executive Body for its consideration at its thirty-third session.

29. The Chair of ICP Integrated Monitoring reported on the results presented at the twenty-second meeting of the ICP Integrated Monitoring Task Force (Westport, Ireland, 7–9 May 2014), in particular with reference to recent work on sulphur and nitrogen input-output budgets, which had indicated the release of previously accumulated sulphur in catchment soils. Nitrogen, on the other hand, still accumulated in the catchments and deposition exceeded leaching. Results of the work on heavy metal budgets indicated a continued accumulation and exceedance of critical loads, particularly for mercury. There was a link between exceedances of critical loads of nutrient nitrogen and nitrogen leaching. Nitrogen critical load exceedances together with emission scenario analysis indicated continued exceedance of site-specific nitrogen critical loads, and in 2020 50 per cent of the Integrated Monitoring sites would still not be protected. Results based on long-term data also indicated that there had been biodiversity effects on ground vegetation from nitrogen deposition exceedance of critical loads for eutrophication.

30. The Working Group:

(a) Took note of the results presented at the twenty-second session of the ICP Integrated Monitoring Task Force, in particular the recent results of its work on priority work items (biodiversity indicators and issues related to critical loads and modelling, heavy metals baselines, budgets and critical loads and sulphur and nitrogen input-output budgets);

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<sup>7</sup> Federal Environmental Agency, Berlin, 2004. Available from [http://icpmapping.org/Mapping\\_Manual](http://icpmapping.org/Mapping_Manual).

(b) Noted the identified increasing risk of heavy metals for biological systems and the negative impacts of nitrogen on biodiversity;

(c) Noted that the intensive data collected at the ICP Integrated Monitoring sites allowed testing and verification of the critical load mapping and dynamic modelling methodologies used for large-scale policy assessment.

31. The Chair of the ICP Modelling and Mapping Task Force and a representative of CCE reported on the outcomes of the joint thirtieth meeting of the Task Force and the twenty-fourth CCE workshop (Rome, 7–10 April 2014) (see joint report, ECE/EB.AIR/WG.1/2014/10). The Chair of the Task Force informed the Working Group about the work carried out by CCE and ICP Modelling and Mapping National Focal Centres (NFCs) on “no net loss of biodiversity indicators” and addressed the 2012–2014 call for data. Results from that call and from collaborations under the EU Effects of Climate Change on Air Pollution and Response Strategies for European Ecosystems (ECLAIRE)<sup>8</sup> project had led to a consensual agreement to further develop a “Habitat Suitability Index”, which would be the basis of the next call for data (see chapter V below). CCE and the Task Force had also contributed to policy-relevant reports (e.g., the update of the core set of indicators for the European Environment Agency, and the Thematic Strategy on Air Pollution report No. 11 for the European Commission). Collaborations with Parties, other countries, Convention bodies and other organizations were ongoing, as was the process of updating the Modelling and Mapping Manual. Preliminary revisions of all the Manual chapters had been made available as informal documents to the thirty-third session of the Working Group. Prior to the next ICP Modelling and Mapping meeting, NFCs would be invited by the Chair to provide their final comments. Following a final discussion at the Task Force meeting, the Manual would be presented for approval by the Working Group on Effects at its thirty-fourth session in September 2015. The updates to chapters 3 and 4, elaborated by ICP Vegetation and ICP Materials, respectively, were appreciated by the Task Force.

32. The Working Group:

(a) Appreciated the progress achieved following results of the 2012–2014 call for data, and encouraged the ongoing development of the Habitat Suitability Index;

(b) Appreciated that all chapters of the Modelling and Mapping Manual had been updated, and noted that the revised Manual would be finalized after review at the meeting of the ICP Modelling and Mapping Task Force in 2015, after which it would be presented to the Working Group at its thirty-fourth session for approval;

(c) Noted that national data under the ICP Forests on critical loads and underlying variables would be provided to NFCs of ICP Modelling and Mapping in the coming weeks, enabling them to complete the national critical loads data for inclusion in the European critical loads database;

(d) Welcomed the proposal for a call to NFCs to adapt critical loads data to the longitude and latitude EMEP grid to update their national critical loads data and to further develop biodiversity-relevant indicators such as the Habitat Suitability Index.

33. The Chair of the Task Force on Health reported on the seventeenth Task Force meeting (Bonn, Germany, 14–15 May 2014), and presented the recent estimates from WHO on the burden of disease from ambient (outdoor) as well as household (indoor) air pollution. Air pollution was the largest environmental risk to health and as a result there was a need to

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<sup>8</sup> See <http://www.eclairer-fp7.eu/>.

increase monitoring throughout the region and to continue to implement efficient risk management measures. In addition, the results of a separate, dedicated WHO expert meeting on methods and tools for assessing the health risks of air pollution at the local, national and international levels were presented. The expert advice from that meeting would inform a variety of efforts under the Task Force and the Task Force on Hemispheric Transport of Air Pollution, as well as under the Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants and others.

34. The Working Group:

(a) Took note of the progress in recent research on the health impacts of air pollution and the importance of the burden of disease from air pollution;

(b) Encouraged the wide dissemination of the advice and availability of the material in other languages, including Russian.

35. The Chair of the Task Force on Health presented the report on “Residential Heating with Wood and Coal: Health Impacts and Policy Options in Europe and North America”. Burning solid fuels in the home created air pollution both indoors and outdoors, and scientific evidence linked that air pollution source to serious health effects. The paper identified policy needs regarding the future use of biomass burning and heating for energy production and highlighted the need for better alignment between climate policy and air pollution policies in many countries for the protection of public health. Reducing residential heating emissions would also have potential health and climate co-benefits. The document also summarized the WHO Indoor Air Quality Guidelines for Household Fuel Combustion, which would be published in October 2014. The Guidelines provided guidance on policies and the impact of different fuels and technologies for cooking, heating and lighting on health, and recommended emission rate targets in order to meet the 2005 WHO Ambient Air Quality Guidelines<sup>9</sup> for carbon monoxide and fine particulate matter (PM<sub>2.5</sub>). A specific recommendation not to use unprocessed coal was proposed, and the household combustion of kerosene was discouraged while further research into its health impacts was conducted.

36. The Working Group welcomed and approved the report from the Task Force on household fuel combustion, and recommended that the document be presented to the Executive Body at its thirty-third session. The Working Group on Effects recommended that the Working Group on Strategies and Review address the need to support and substantially improve best available technologies for appliances for wood burning for residential heating.

37. The Chair of the Joint Expert Group on Dynamic Modelling summarized the progress in the Group’s work as presented at its fourteenth meeting (Sitges, Spain, 28–30, October 2013), in particular, the dynamic modelling with respect to nutrient nitrogen, the biological response to changing deposition, aquatic biodiversity and interactions between climate change and air pollution. Other highlights included novel work on linking plant diversity and abiotic parameters to the mapping of critical loads, work on biodiversity indicators for both terrestrial and aquatic environments, and the use of models to link air pollution with ecosystem services. The 2014 Joint Expert Group meeting would be organized together with the Swedish Clean Air and Climate Research Program.<sup>10</sup>

38. The Working Group acknowledged the work of the Joint Expert Group on Dynamic Modelling and noted that it operated across several ICPs and other bodies under the

<sup>9</sup> See [http://www.who.int/phe/health\\_topics/outdoorair/outdoorair\\_aqg/en/](http://www.who.int/phe/health_topics/outdoorair/outdoorair_aqg/en/).

<sup>10</sup> See [www.scac.se](http://www.scac.se).

Convention. It also approved the plan for the 2014 Joint Expert Group meeting and the plans for continued work in 2015 outlined at the meeting.

## V. Proposed call for data by the Coordination Centre for Effects and the International Cooperative Programme on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends

39. Following the recommendation of the Task Force on Modelling and Mapping at its thirtieth meeting (Rome, 7–10 April 2014), CCE presented the Task Force proposal to issue a call to NFCs for data on critical loads and biodiversity indicators in autumn 2014, with a spring 2015 deadline. The new call for data met the objectives of the Convention's Long-Term Strategy and the objective of the 2014–2015 workplan.

40. The exact budget for CCE tasks in 2015, according to the workplan agreed by the Executive Body in 2013, was still subject to deliberations.

41. The aims of the call for data were:

(a) To adapt the critical load database to the new  $0.50^\circ \times 0.25^\circ$  and  $0.1^\circ \times 0.1^\circ$  longitude-latitude grids to ensure compatibility of the European critical loads database with the new EMEP grid resolution;

(b) To offer the possibility to NFCs to update their national critical load data, including novel approaches to calculate sulphur and nitrogen critical load functions taking into account their impact on biodiversity. NFCs would be encouraged to submit data on a Habitat Suitability Index (HS-index) agreed at the meeting of the Task Force on Measurements and Modelling;

(c) To respond to the policy demand for a special emphasis on biodiversity. The HS-index should provide a metric for “no net loss of biodiversity” in regional (Task Force on Integrated Assessment Modelling) assessments of emission reduction scenarios.

42. The call would be organized so that three levels of responses were possible:

(a) *Basic*: Converting existing critical loads/functions to a  $0.10^\circ \times 0.05^\circ$  longitude-latitude grid;

(b) *Intermediate*: Updating critical loads, possibly including a biodiversity indicator, before converting existing critical loads/functions, as set out in subparagraph (a) above;

(c) *Advanced*: Using (steady-state or dynamic) biodiversity models for the assessment of the HS-index to derive (four-point) nitrogen and sulphur critical load functions.

43. Technical details to assist NFCs with the work and data required to respond to the call for data were described in a technical annex compiled by CCE. The technical annex would be sent to NFCs and would also be available on the CCE website.<sup>11</sup>

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<sup>11</sup> See [www.wge-cce.org](http://www.wge-cce.org).

## 44. The Working Group:

(a) Took note of the response to the 2012–2014 call for data on no net loss of biodiversity and the recommendation by the ICP Modelling and Mapping Task Force at its thirtieth meeting for a follow-up call for data on the HS-index;

(b) Also recognized the need for the new call for critical loads data, inter alia, to ensure the compatibility of the European critical loads database with the revised EMEP grid system, in which critical loads exceedances were computed using the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) Model;<sup>12</sup>

(c) Recommended the following update and extension to the 2014–2015 workplan item 1.2.1 (b) “tentative applications of the Habitat Suitability Index on a regional scale, including a call for NFC contributions as agreed by the Task Force on Modelling and Mapping at its thirtieth meeting (Rome, Italy, 7–10 April 2014); see also workplan items 2.3.8 and 4.8.”;

(d) Welcomed the proposal for a call to NFCs to adapt critical loads data to the longitude and latitude EMEP grid to update their national critical loads data and to further develop biodiversity relevant indicators, such as the HS-index;

(e) Requested CCE to organize the new call for data and to report its results to the ICP Modelling and Mapping Task Force at its thirty-first meeting, to be held in Zagreb in 2015, as well as to the Working Group at its thirty-fourth session.

## VI. Information sharing from Parties on their national effects-oriented activities

45. Three representatives of Switzerland reported on national activities under the Working Group on Effects highlighting:

(a) *Health-related work*: Switzerland had published an updated report on the health effects of air pollution for the year 2010. It was estimated that every year around 3,000 people died prematurely due to air pollution and 30,000 years of life were lost, leading to costs of approximately 4 billion Swiss francs. Switzerland continued to support the Swiss Cohort Study on Air Pollution and Lung Diseases in Adults (SAPALDIA), which had been an essential contribution to the European Study of Cohorts for Air Pollution Effects (ESCAPE).<sup>13</sup> Twenty-five years later, SAPALDIA would soon be going into its third round of re-examination. Switzerland also continued to support a publicly accessible literature database on air pollution and health, LUDOK;<sup>14</sup>

(b) *Ozone effects on forest trees*: An epidemiological analysis of ozone effects on the growth of beech and Norway spruce had recently been published.<sup>15</sup> The study was based on observations at 62 beech and 42 Norway spruce plots in Switzerland, covering 4,826 trees in total. The Phytotoxic Ozone Dose (POD<sub>1</sub>) had been calculated with the ozone flux model DO3SE<sup>16</sup> and mapped for forest areas in Switzerland. The influence of

<sup>12</sup> See <http://gains.iiasa.ac.at/models/>.

<sup>13</sup> See <http://www.escapeproject.eu/>.

<sup>14</sup> Dokumentationsstelle für Luft und Gesundheit. See <http://ludok.swisstph.ch>.

<sup>15</sup> See Sabine Braun, Christian Schindler, Beat Rihm, “Growth losses in Swiss forests caused by ozone: Epidemiological data analysis of stem increment of *Fagus sylvatica* L. and *Picea abies* Karst”, *Environmental Pollution*, vol. 192 (September 2014), pp. 129–138.

<sup>16</sup> See <http://www.sei-international.org/do3se>.

confounding factors had been included in the analysis. The results suggested that the dose-response curve from ozone fumigation experiments with seedlings or saplings was also valid for mature trees;

(c) *Air pollution impacts on biodiversity*: in responding to the CCE 2012–2014 call for data, two approaches had been chosen to address impacts of air pollution on biodiversity. For forest ecosystems, dynamic models linked with vegetation modules had been applied for 28 sites with available soil solution and vegetation monitoring data. The chemistry of the soil solution had been modelled quite successfully, although some difficulties remained with nitrogen compounds. The link with the ground vegetation had not, so far, led to plausible results compared with field observations. The second approach consisted in deriving exposure-response relationships for species-rich mountain hay meadows and (sub)alpine scrub habitats by carrying out a multivariate analysis using data from the Swiss Biodiversity Monitoring network<sup>17</sup> and modelled nitrogen deposition with high spatial resolution. Several confounding factors had been included in the analysis. The results clearly indicated a steeper decline of the species richness of oligotrophic species compared with the decline of total species richness with increasing nitrogen deposition.

46. A representative of Spain reported on the national activities contributing to the work of ICP Forests, ICP Integrated Monitoring, ICP Materials, ICP Modelling and Mapping and ICP Vegetation. Spain had been particularly active in the ICP Vegetation work, where Spanish research groups had parameterized the ozone flux model for crops, annual grasslands and forests under Mediterranean conditions. The most important contributions had focused on modelling the influence of phenology and soil moisture, considering that soil moisture was required for ozone flux modelling in water-limited ecosystems. However, the simplified flux model (designed for indicating the risk of damage and used in GAINS) did not include the effect of soil moisture on stomatal conductance, and thus the risk of ozone damage might be overestimated in water-limited areas. The simplified flux model was therefore not suitable to address the European-wide risk assessment.

47. A representative of Italy reported on the organization of national effects-oriented work and its contributions to the work of ICP Forests, ICP Integrated Monitoring, ICP Materials, ICP Modelling and Mapping and ICP Vegetation. Italian experts had participated in a number of research projects: the International Project for a Better Quality of Life in Our Cities (TRECITY); the Ozone and Climate Change Impacts on French and Italian Forests: Refinement of criteria and thresholds for forest protection (FO<sub>3</sub>REST)<sup>18</sup> project; the Forest Ecosystem Controls (CONECOFOR) project;<sup>19</sup> and the pilot study on inventory and condition of stock of materials at risk at UNESCO cultural heritage sites. A good example of cooperation between different effects communities had been the participation in the European project on the application of dynamic models (VSD+ and vegetation module) to ICP Integrated Monitoring sites to look at vegetation response to changes in nitrogen deposition scenarios.

48. A representative of Norway reported on the ongoing national project to calculate areas at risk for acidification in 2020. The calculated area at risk for exceeding critical loads for acidification (11.1 per cent of total area) had been substantially higher using ground measurement data (NILU) as compared with modelled deposition data (EMEP; 3.5 per cent of total area). That discrepancy had to be further investigated as the policy messages from

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<sup>17</sup> See <http://www.biodiversitymonitoring.ch/en/home.html>.

<sup>18</sup> See <http://fo3rest.eu/project/objective.php>.

<sup>19</sup> See [http://www.idrolab.ise.cnr.it/index.php?option=com\\_content&view=article&id=56&Itemid=56&lang=en](http://www.idrolab.ise.cnr.it/index.php?option=com_content&view=article&id=56&Itemid=56&lang=en).

the two approaches were very different: either the acidification problem had been almost solved, or significant surface water acidification remained. The project in question would be finalized in December 2014 and its result would be published on the website of the Norwegian Environment Agency.<sup>20</sup>

49. A representative of Slovenia reported on national effects-oriented work and its contribution to the work of ICP Forests, ICP Modelling and Mapping and ICP Vegetation. With respect to forests, level I and II measurements had shown continued high nitrogen deposition levels and significant crown defoliation. Slovenia also contributed to ozone impact assessment for natural vegetation and selected crops. Information was also provided on the monitored deposition of heavy metals (cadmium and chromium), nitrogen and polycyclic aromatic hydrocarbons in mosses. The respective NFCs had contributed to the two latest calls for data issued by CCE. A big issue was the decreasing funding for effects activities, partly due to its voluntary nature. There was also competition for funding for environmental monitoring between the work for the Convention and other conventions at the European level. ICP Forests activities had been included in the national forestry legislation and the forest inventory had remained the only national multipurpose inventory in Slovenia, as well as the only methodologically grounded monitoring of terrestrial ecosystems.

50. A representative of the Czech Republic reported on the organization of national effects-oriented work and the country's contributions to the work of ICP Forests, ICP Integrated Monitoring, ICP Modelling and Mapping, ICP Waters and the Joint Expert Group on Dynamic Modelling. Czech experts had contributed to the call for data issued by CCE in 2012, and had undertaken extensive work on forest ecosystems. However, decreasing funding for the effects activities was also an issue for the country. As a result, the national activities in relation to ICP Waters could not be continued and the work in other areas (notably on forests and dynamic modelling) had had to be scaled down.

51. The Working Group welcomed the information presented by Czech Republic, Italy Norway, Slovenia, Spain and Switzerland on their national work and invited other Parties to provide information on their national effects-related work at the next sessions of the Working Group, so that an exchange of information on national work would become a regular part of the Working Group sessions.

52. The Working Group noted that the underestimated levels of nitrogen depositions in the EMEP model for various areas in Europe — as reported by Italy, Norway, Spain and Switzerland — had led in turn to the underestimation of the exceedances of critical loads for acidity and eutrophication and an underestimation of nitrogen related damage to ecosystems. The Working Group invited EMEP to investigate the issue in collaboration with the relevant Parties and to report on the outcome of the analysis to the Working Group at its thirty-fourth session.

## **VII. 2014–2015 workplan for the implementation of the Convention**

53. The Chair noted that the progress reports from the various subsidiary bodies were in line with the 2014–2015 workplan. In particular, the Chair noted with satisfaction that the subsidiary bodies of the Working Group had continued their frequent production of

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<sup>20</sup> See [www.miljodirektoratet.no](http://www.miljodirektoratet.no).

integrated reports (workplan item 1.8.1). The new initiative on a trends report (see sect. III above) was also part of that integrated approach.

54. The progress in developing common standards and a common portal (item 1.8.2) had fallen short of the workplan targets. One of the most urgent issues for the Working Group was to establish a common portal for all effects-related activities from which it would be possible to link to the web pages of all the subsidiary bodies of the Convention. The difficulty had been in finding financial support for the common portal, and the Chair urged Parties to look for financial support for that activity. The EMEP portal could serve as a model for the Working Group. The Chair of the Task Force on Measurements and Modelling noted that the EMEP web page already had links to several ICPs, and suggested that the EMEP portal could also be used for the Working Group's subsidiary bodies.

55. Turing to progress on workplan item 1.8.3 (merging activities/integrated work/joint meetings), the Chair underlined the request for having joint meetings between ICPs. Several Parties and ICPs argued against that suggestion, as it would take a good deal of effort and time to organize common meetings. Instead, it was proposed to have more open scientific workshops. Representatives of several ICPs noted that there were already a number of activities supporting collaboration and exchange of information between different ICP communities. There were also EU projects, such as ECLAIRE, that offered opportunities for the scientific communities to meet. One Party welcomed the organization of scientific workshops by ICPs, but argued that invitations were often too limited. The Chair concluded that, although several activities had already been undertaken in order to integrate the work of the ICPs, more effort was still needed. It was noted that the ICP networks were quite strong communities, but from the outside they were sometimes perceived as too closed. Each ICP should therefore by itself or together with others further consider options for collaborations and opening of their meetings and workshops to the outside world.

56. The Chair reported that the Executive Body Bureau had discussed the issue of finding a more stable long-term financing mechanism (item 1.8.4.) for the ICP Programme Centres. It had been agreed that those Parties that were not already making voluntary contributions to effects-related activities should be contacted and encouraged to give the necessary support to the effects-related trust fund.

## **VIII. Outreach and sharing information with other regions**

57. A representative of the Regional Resource Centre for Asia and the Pacific (RRCAP)<sup>21</sup> informed the Working Group about the air pollutant impact studies under the Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia,<sup>22</sup> which focused on damage to human health, crops and ecosystems. The findings of health-related studies, carried out in locations where particulate matter concentrations were at the highest levels in Asian cities, emphasized the high costs of air pollution and the need to implement cost-effective measures to reduce emissions of health-damaging air pollutants. There was wide-spread evidence of plant-damaging levels of ozone during the main growing seasons of important South Asian crops, such as mung bean, spinach, wheat and potato. Modelling results suggested that acidification was a major issue compared to eutrophication and posed a potentially greater threat to ecosystems and their biodiversity. Nitrogen pollution from transport, industry and agriculture had been

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<sup>21</sup> See <http://www.rrcap.ait.asia/>.

<sup>22</sup> See <http://www.rrcap.ait.asia/male/>.

linked to health impacts, impacts on ecosystems, crops and climate change, as well as the formation of ground-level ozone. However, there was insufficient funding for effects-related work in South-East Asia, and the Parties to the Convention were urged to provide financial support for those efforts.

58. The Working Group welcomed the information presented by the representative of the Malé Declaration secretariat and encouraged all ICPs to seek ways to start or enhance existing collaboration with the respective research groups in South-East Asia.

## **IX. Financing of the effects-oriented activities**

59. In line with revised decision 2002/1 of the Executive Body, the secretariat introduced the key elements of the note on the financing of effects-oriented activities (ECE/EB.AIR/WG.1/2014/4), presenting updated information on cash contributions to the trust fund in 2013 and 2014. There had been a decreasing trend over the last five years. However, on the positive side, there had also been substantial in-kind cash contributions made directly to the ICP Centres by the lead countries of the Programmes and by the countries hosting the Programme Centres (*ibid.*, tables 4 (a) and (b) in document ECE/EB.AIR/WG.1/2014/4).

60. The secretariat also presented information on the implementation (including payments) of contracts (Memorandums of Understanding) for 2014, and the preparation of contracts for 2015.

61. The Working Group:

(a) Approved the key elements of the note on the financing of the effects-oriented activities, and decided to submit the information to the Executive Body;

(b) Approved the 2015 international coordination costs of \$2,152,700 for different elements of effects-oriented activities and the provisional estimate of \$2,152,700 for 2016 and 2017 costs, for submission to the Executive Body;

(c) Invited the secretariat to provide information on the status of contributions to the trust fund for the effects-oriented activities as of 30 November 2014, and to make it available to the Executive Body at its thirty-third session;

(d) Recommended that the status of contributions be used as a basis for the budget to co-fund the effects-oriented activities in 2015;

(e) Requested the Executive Body to encourage Parties to make contributions to the trust fund before 30 November each year;

(f) Noted with appreciation the essential support provided to the Working Group on Effects and its effects-oriented activities by lead countries, countries and organizations hosting coordinating centres, organizing meetings and funding activities of their national focal centres, as well as the active participation of national experts in the work under the Convention;

(g) Noted with appreciation the amount of voluntary cash contributions available in 2013 and 2014, but reiterated its invitation to all Parties that had not yet done so to provide to the trust fund for financing of the effects-oriented activities, without undue delay, the contributions decided by the Executive Body in its revised decision 2002/1.

## **X. Other business**

62. The Chair informed the Working Group that the thirty-ninth session of the EMEP Steering Body would be held jointly with the thirty-fourth session of the Working Group on Effects, from 14 September (afternoon) to 18 September (morning) 2015 in Geneva. The meeting of the joint Extended Steering Body Bureau and the Extended Bureau of the Working Group on Effects was tentatively scheduled to be held in Geneva from 23 to 27 March 2015.

## **XI. Adoption of the decisions of the Working Group**

63. The Working Group on Effects adopted the decisions taken during the session.

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