

INTRODUCTION

Persistent organic pollutants (POPs) constitute a group of toxic compounds, known to have adverse effects to human health and wildlife. Many of POPs are resistant to degradation and globally dispersed in the environment, cycling between the atmosphere and terrestrial and aquatic compartments. Due to these properties reduction of POP releases and pollution levels is among priority tasks of many international and national organizations including UNEP Rotterdam, Basel, and Stockholm Conventions, World Health Organization (WHO), the Arctic Monitoring and Assessment Program (AMAP), Helsinki Commission (HELCOM), and European Union in the framework of EU Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

POPs were included into activities of the UNECE Convention on Long-range Transboundary Air Pollution (hereafter, CLRTAP or the Convention) since the adoption of the Aarhus Protocol on Persistent Organic Pollutants in 1998. The information on emissions, air pollution levels, and transboundary transport of selected POPs within the geographical scope of Co-operative Programme for Monitoring and Evaluation of Long-range Transmission of Air Pollutants in Europe (EMEP) is regularly produced by its scientific Centres and provided to the Executive Body for the Convention (www.emep.int).

The Centre of Emission Inventories and Projections (CEIP) generates gridded POP emission data on the basis of national emission inventories, reported by Parties to the Convention as well as expert estimates and other available data. The Chemical Coordinating Centre (CCC) supports EMEP with monitoring and analytical strategies and guidelines in order to gather quality data to evaluate spatial and temporal trends in air pollution across the EMEP region. The Meteorological Synthesizing Centre East (MSC-E) is responsible for the development and application of modelling tools for the assessment of air pollution levels and transboundary transport of POPs within the EMEP domain.

This Status Report presents the outcome of POP pollution assessment, performed by the EMEP Centres in accordance with the bi-annual work-plan of the Convention for 2018-2019 [ECE/EB.AIR/GE.1/2017/20-ECE/EB.AIR/WG.1/2017/13]. Measurements of POP concentrations in the EMEP region, performed by the EMEP monitoring network, are overviewed in *Chapter 1*. More detailed discussion is provided for the observations of PCBs and PAHs to highlight the importance of long-term monitoring and issues, which may merit further attention. Besides, complementary monitoring activities aimed to assess POP pollution levels in the EMEP region and beyond are described.

Assessment of pollution levels and transboundary transport of PAHs, included into the Protocol on POPs, is described in *Chapter 2*. Analysis of spatial and temporal variability of PAH pollution levels within the EMEP domain is carried out on the basis of modelling results and measurements of the EMEP monitoring network for 2016 as well as national measurements from EEA AIRBASE. Transboundary transport of the selected PAHs is evaluated taking into account anthropogenic emission sources of the EMEP countries as well as influence of non-EMEP emissions. In addition, estimates of PAH pollution for the Arctic area within the EMEP region are also provided. Main emphasis is given to the assessment of B(a)P pollution levels and evaluation of exceedances of EU target value and WHO reference level defined for B(a)P air concentrations.

In *Chapter 3* ongoing activities in framework of country-specific case study of B(a)P pollution in the EMEP countries are outlined. Evaluation of B(a)P pollution levels in Spain is continued. Besides, similar work is initiated for France. Current stage of the study is mainly focused on the analysis of discrepancies between B(a)P modelling results and observed pollution levels taking place for Spain and France as well as for some other EMEP countries. This activity includes construction of experimental emission scenarios and test model simulations in order to evaluate sensitivity of model predictions to possible uncertainties in the officially reported emission data. Particular attention is also paid to possible uncertainties in the applied modelling approach for B(a)P. Model simulations and their analysis are performed in close cooperation with national experts in modelling of B(a)P pollution.

Assessment of PCDD/F, PCB, and HCB pollution levels in the EMEP countries is given in *Chapter 4*. Model simulations are carried out on the basis of officially reported emission data for the new EMEP grid using the multi-media GLEMOS modelling system. Spatial trends of air pollution levels in 2016 on regional and global scales are characterized as well as transboundary transport of pollution is evaluated. Results of model simulations were compared with measurements of the EMEP monitoring sites and data of national monitoring networks. Main emphasis in these activities is given to the evaluation of PCDD/F pollution levels in the EMEP countries.

MSC-E activities related to co-operation and information sharing with subsidiary bodies to the Convention and other international organisations are discussed in *Chapter 5*. Results of recent activities of the Centre with regard to the assessment of POP pollution have been presented and discussed at the meetings of the EMEP task forces, namely, Task Force on Measurements and Modelling (TFMM) and Task Force on Emission Inventories and Projections (TFEIP). Special attention is also paid to the collaboration with other international organizations and programmes including the Stockholm Convention, the Arctic Monitoring and Assessment Programme (AMAP), and Helsinki Commission (HELCOM).

Detailed information on long-range transport and pollution levels of POPs in the EMEP region as well as in particular EMEP countries is presented at the MSC-E website (www.msceast.org). Similar information on POP pollution in the EMEP countries of Eastern Europe, Caucasus and Central Asia (EECCA) is also given at the MSC-E website in Russian (www.ru.msceast.org).