

MAIN CHALLENGES AND DIRECTIONS OF FUTURE RESEARCH

This report summarizes the outcome of current activities of the EMEP Centres, MSC-E and CCC, aimed at assessment of POP pollution in the EMEP region. It provides information on POP transboundary transport and pollution levels in 2014, with emphasis to PAH pollution in the EMEP countries, and identifies main directions of future improvement of POP pollution assessment and model development. In this section main challenges that need to be addressed in further research and operational work are outlined.

- Reported emission data for POPs are characterised by significant uncertainties. The key parameters of POP emission, which affect quality of model assessment, are analysed and ranked with regard to their priority. It has been noted that completeness of gridded emission data has the highest priority. Other important parameters include intra-annual variations of PAH and PCDD/F emissions, and information on congener profiles for PCDD/Fs and PCBs. In addition, development and refinement of global scale inventories as well as historical emissions for long-living POPs (PCDD/Fs, PCBs, HCB) are required. This ranking can form a basis for subsequent improvement of emission inventories that can be realized in cooperation with CEIP, TFEIP, and national experts.
- Air pollution by carcinogenic PAHs is recognized as a serious problem in areas with dense population of many EMEP countries. To improve evaluation of PAH pollution levels and to contribute to the analysis of population exposure a study aimed at quantification of B[a]P air concentrations in urban areas is initiated. Preliminary estimates of B[a]P pollution in the Czech Republic show in general reasonable agreement with measurements. At the same time, some discrepancies require further development of the applied approach in order to reduce the level of uncertainties in estimates of B[a]P concentrations. At the next stages of this work the proposed approach can be used to other EMEP countries, provided that the data on emissions and measurements are available. This activity requires close co-operation with national experts on monitoring and assessment of PAH pollution levels as well as with experts from TFEIP, CEIP, CCC, and EEA.
- Improvement of the quality of model assessment of POP pollution levels and trends is one of the important tasks under EMEP. Future development of the Global EMEP Multi-media Modeling System (GLEMOS) will include transition of the EMEP operational modelling of POPs to the new EMEP grid, updating of open code version of GLEMOS, and refinement of parameterization of atmospheric transformation and removal processes for POPs as well as inter-media exchange. Activities, related to the refinement of evaluation of POP pollution, will also comprise collection and analysis of information on congener composition of emissions and concentrations of PCDD/Fs and PCBs, which is essential for the evaluation of PCDD/F and PCB transport and fate in the environment as well as for exposure studies.
- Monitoring of POP concentrations is one of the key sources of information for the assessment of environmental contamination and temporal trends of pollution levels. At present, measurements of POP concentrations, provided by the EMEP monitoring network, are available mainly for the western, central and northern parts of Europe, whereas its southern part and the EECCA region

require improvement of spatial coverage by measurements. In addition, measurement data on POP concentrations in the atmosphere and surface media from national monitoring networks can be an additional source of information for the refinement of POP pollution assessment. Besides, further cooperation with international organizations (e.g. EU EEA, UNEP SC, AMAP, HELCOM), performing monitoring of POPs and collection of measurement data is highly appreciated. Another important issue is related to quality assurance and quality control of POP monitoring data in the EMEP region and other regions as well as comparability of measurement data of different monitoring networks.

- Cooperation between the UNEP Stockholm Convention and EMEP and exchange of information on measurements and emissions of POPs are of particular importance for the evaluation of POP pollution of the EMEP countries. National emission inventories, reported by countries to the Stockholm Convention, provide useful information on POP emissions (e.g. PCDD/Fs) for further studies of environmental pollution by POPs both in the EMEP region and on the global scale. Along with data on emissions, significant amount of global scale measurements of POP concentrations in the atmosphere and other environmental compartments is compiled in the UNEP SC GMP Data Warehouse, which can be used for the refinement of assessment of current pollution levels and their temporal trends.