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**United Nations  
Environment  
Programme**

**Stockholm Convention on Persistent Organic Pollutants  
Persistent Organic Pollutants Review Committee  
Third meeting**

Geneva, 19–23 November 2007  
Item 7 of the provisional agenda\*

**Presentation on environmental transport and modelling**

**The OECD screening tool for overall persistence and long-range  
transport potential**

**Note by the Secretariat**

1. Potential for long-range environmental transport is one of the screening criteria set out in paragraph 1 of Annex D of the Stockholm Convention that must be satisfied if a chemical is to be listed in annexes A, B or C of the Convention. According to subparagraph (d) of Annex D, it is evidenced for a given chemical by:

- “(i) Measured levels of the chemical in locations distant from the sources of its release that are of potential concern;
- (ii) Monitoring data showing that long-range environmental transport of the chemical, with the potential for transfer to a receiving environment, may have occurred via air, water or migratory species; or
- (iii) Environmental fate properties and/or model results that demonstrate that the chemical has a potential for long-range environmental transport through air, water or migratory species, with the potential for transfer to a receiving environment in locations distant from the sources of its release. For a chemical that migrates significantly through the air, its half-life in air should be greater than two days”.

2. At the second meeting of the Persistent Organic Pollutants Review Committee, it was noted that the Organisation for Economic Cooperation and Development (OECD), working with the United Nations Environment Programme (UNEP), had developed a model to predict the environmental fate and long-range transport of persistent organic pollutants. The Chair of the Committee suggested

\* UNEP/POPS/POPRC.3/1/Rev.1.

that an expert who had been involved in that work might be invited to attend the Committee's third meeting to demonstrate the model.

3. In response to the Chair's suggestion, Dr. Martin Scheringer from the Swiss Federal Institute of Technology Zurich was invited to provide a presentation at the third meeting of the Committee on the OECD screening tool for overall persistence and long-range transport potential. A summary of the presentation is contained in the annex to the present note. It is presented as received and has not been formally edited by the Secretariat.

4. A side event on environmental transport and modelling will be organized during the lunch period on Tuesday, 27 November, at which Professor Michael McLachlan from Stockholm University and Dr. Scheringer will give further presentations regarding long-range transport models. Their presentations will be followed by discussion on the topic.

## Annex

### The OECD screening tool for overall persistence and long-range transport potential

Martin Scheringer, Matthew MacLeod, Fabio Wegmann, Swiss Federal Institute of Technology Zurich (ETH Zurich), [scheringer@chem.ethz.ch](mailto:scheringer@chem.ethz.ch).

Overall persistence (Pov) and long-range transport potential (LRTP) are indicators describing the potential of chemicals to be present in the environment for a long time and to be transported over long distances (Scheringer 1996). High Pov and LRTP are unwanted properties of chemicals because, if a chemical with high Pov and LRTP causes health effects in humans or wildlife, these effects will cover a large area and can persist for a long time. In October 2001, a workshop on the “Use of Multimedia Models for Estimating Overall Environmental Persistence and Long-Range Transport in the Context of PBTs/POPs Assessment”, organized by UNEP and OECD, was held in Ottawa, Canada. Recommendations from the workshop were that different multimedia models should be compared and that a core set of multimedia models should be available and accessible at no cost to the public.

Based on these recommendations, the developers of nine multimedia fate and transport models performed a comparison of their models with respect to the ranking of chemicals in terms of Pov and LRTP (Fenner et al. 2005). They used a set of 3175 hypothetical chemicals covering a broad range of chemical properties to investigate how closely the nine models would rank them in terms of Pov and LRTP. Whereas absolute Pov and LRTP values differed considerably among the models, the rankings of the 3175 chemicals were highly similar for Pov and still considerably similar for LRTP. This indicates that the models yield similar results for the purpose of identifying chemicals with high Pov and LRTP. On this basis, the model developers agreed that a consensus model representing the essential features of the different models should be developed. The OECD agreed to support the development of the consensus model and to make it available from the OECD web site. The model was developed in 2005 by a team of researchers at ETH Zurich (Wegmann et al. 2007) and presented at international workshops in Switzerland, Canada and Japan. The main purpose of the model is to provide estimates of Pov and LRTP of organic chemicals and to present these estimates in an intuitive way. It is included in a single MS Excel spreadsheet that can easily be used on any personal computer.

The model has been applied to the POP candidates that have been proposed for inclusion in the list of POPs of the Stockholm Convention. These were  $\gamma$ -HCH, pentabromodiphenyl ether (BDE-99), hexabromobiphenyl, and chlordecone in 2006 (PFOS was excluded) and penta-chloro-benzene,  $\alpha$ - and  $\beta$ -HCH, octabromo-diphenylether, and short-chain chlorinated paraffin in 2007. Results for Pov and LRTP of these substances will be presented and discussed in the talk, and the application of the model will be illustrated.

1. Fenner, K., Scheringer, M., MacLeod, M., Matthies, M., McKone, T.E., Stroebe, M., Beyer, A., Bonnell, M., Le Gall, A.C., Klasmeier, J., Mackay, D., Pennington, D.W., Scharenberg, B. (2005) Comparing Estimates of Persistence and Long-Range Transport Potential among Multimedia Models, *Environmental Science & Technology* 39, 1932–1942.
2. Scheringer, M. (1996) Persistence and Spatial Range as Endpoints of an Exposure-Based Assessment of Organic Chemicals, *Environmental Science & Technology* 30, 1652–1659.
3. Wegmann, F., Cavin, L., MacLeod, M., Scheringer, M., Hungerbühler, K. (2007) The OECD Software Tool for Screening Chemicals for Persistence and Long-Range Transport Potential, under review for *Environmental Modeling and Software*. Available on request from the authors.