

The 2nd Workshop on Reduction of Unintentional POPs in East Asian Countries

Mar. 9-10, 2009 *Todofuken-kaikan*, Tokyo, Japan

Summary (Chair: Shinichi Sakai, Ph.D)

1. The 2nd workshop on Reduction of Unintentional POPs in East Asian Countries was held in Tokyo, Japan, on 9-10th of March, 2009. The workshop was attended by administrative officers and experts from 10 East Asian countries (People's Republic of China, Kingdom of Cambodia, Republic of Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Republic of Singapore, Kingdom of Thailand and Socialist Republic of Vietnam), the United States of America, the United Nations Environment Program (UNEP), the European Union (EU) and the Japan International Cooperation Agency (JICA), as well as observers. The workshop program included an opening session and three separate sessions, each focusing on a different topic. Session 1 presented papers on "Identification of significant source categories and of unintentional POPs and the development and application of unintentional POPs inventories in East Asian Countries"; session 2 on "Information exchange for measures of source categories of unintentional POPs"; and session 3 on "Knowledge for future efforts".

2. The opening session started with an opening remark from Mr. Junichi Shiraishi, Director-General of Environmental Management Bureau, Ministry of the Environment, Japan. In his speech, he stressed the significance of the workshop for environmental management in Asia, which was addressed in the East Asian Summit Environmental Ministers' Meeting and the Clean Asia Initiative launched by Japan, and in recent global chemical safety meetings related to POPs and mercury.

The first keynote speech was given by two scientists: Dr. Shinsuke Tanabe and Dr. Shin Takahashi, both from Ehime University, Japan. In their speech, they explained the environmental contamination by POPs in East Asian countries by using mussels and human breast milk as bio-indicators. Their research data also reported high concentration of polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDD/PCDFs) in soils from dumping sites, significant polybrominated diphenyl ether (PBDEs) concentration in

newly industrialized regions, and problems concerning e-waste recycling in Asian countries. They also suggested continuation of monitoring, clarification of specific and potential sources, risk assessments of human exposure, utilization of screening methods like bioassay and further efforts to reduce emissions of unintentional POPs in view of best available techniques/best environmental practices (BAT/BEP).

3. The second keynote speech was delivered by Dr. Heidelore Fiedler, UNEP Chemicals Branch in Geneva, Switzerland. Dr. Fiedler described the following in her speech: current activities on unintentional POPs undertaken by UNEP, including an update on the Stockholm Convention, including the nine candidate POPs proposed for inclusion to the Convention at COP4 (*i.e.*, pentachlorobenzene (PeCB) as unintentional POP), other POPs for consideration (short chain chlorinated paraffins (SCCP), hexabromocyclododecane (HBCD)), BAT/BEP guideline, examples of dioxin contamination in food and mothers' milk, global monitoring of POPs and guidance document for POPs analysis, the status of dioxin inventories, the PCDD/PCDFs Standardized Toolkit and the activities under the Toolkit updating process such as activities and projects on open burning of biomass/waste, brick production, simple stoves, and metal production.

4. In session 1, four country reports on "Identification of significant source categories and of unintentional POPs, and the development and application of unintentional POPs inventories in East Asian Countries" were presented and discussed. Prof. Yoko Masuzawa from Nagoya University, Japan and Dr. Pattanan Tarin from the Pollution Control Department, Thailand, co-chaired the session.

Japan presented emission factors of hexachlorobenzene (HCB) and polychlorinated biphenyl (PCB) in air emission from significant source categories in comparison to PCDD/PCDFs, and presented a preliminary inventory of HCB and PCB. Japan also explained co-benefits for inventory development between greenhouse gases (GHG) or mercury and unintentional POPs.

The Republic of Indonesia presented estimations of PCDD/PCDFs using the Standardized Toolkit (UNEP, 2001). In the Republic of Indonesia,

emission of PCDD/PCDFs from chemical material and consumed goods production was 4,442 g I-TEQ, and this accounted for about 60% of the total emission.

Malaysia presented estimations of PCDD/PCDFs using Standardized Toolkit (UNEP, 2001) from significant source categories were waste incineration and ferrous and non-ferrous metal production and their respective yearly emission of PCDD/PCDFs were 72.2 g I-TEQ and 41.75 g I-TEQ, respectively. Malaysia also pointed out that they have imposed permissible emission limit for Municipal solid waste incinerator, scheduled waste incinerator, pulp and/or paper industry sludge incinerator and sewage sludge incinerator.

The Kingdom of Cambodia reported that uncontrolled combustion processes was the main source categories of unintentional POPs emission and this accounted for over 90% of total emission (using the 5-vector approach of the Toolkit). The Kingdom of Cambodia's national issues include insufficient regulation concerning unintentional POPs and its enforcement, and the lack of knowledge on unintentional POPs management among technical staff, decision makers and stakeholders. A national action plan to reduce unintentional POPs release was developed and some activities against unintentional POPs release are now being undertaken to deal with the above issue.

During the discussion, a participant asked the presenter from Japan the reason for the large amount of PCB emissions during secondary aluminum and secondary zinc productions. The presenter explained that although the detailed mechanism was unknown, the possibility of unintentional formation could be considered. Another participant asked why large amount of lower chlorinated congeners, such as monochlorinated biphenyl (M1CB) and dichlorinated biphenyl (D2CB) were present in cement kiln. Furthermore, the participant asked for the definition of PCB congeners. The presenter replied that there was a need to survey the difference according to the definition of PCB congeners. Questions on sampling methods used for PCB and HCB and on the measurements of total PCB or PCB congeners were also raised. The presenter replied that PCDD/PCDFs sampling method was used and total PCBs were measured in the study. With regards to the presentation of the Republic of Indonesia, a participant inquired on the inventory regarding paper and pulp industry. The presenter

from Malaysia was asked how the Environmental Quality (PCDD/PCDFs) Regulations are enforced. The presenter from the Kingdom of Cambodia was asked on the estimation method of unintentional POPs emission values of uncontrolled combustion and open burning process, since values reported were high. It was agreed that generally it is difficult to estimate emission factors and activities from open burning. Japan proposed to compile PCDD/PCDFs inventory data of East Asian countries for presentation at the 3rd unintentional POPs workshop.

5. In session 2, topics on “Information exchange for measures of source categories of unintentional POPs” were discussed. Dr. Masatoshi Morita from Ehime University, Japan and Dr. Gang Yu from Tsinghua University, People’s Republic of China, co-chaired the session. Four country reports were presented on the subject.

People’s Republic of China presented unintentional POPs reduction in the People’s Republic of China. The presentation also included BAT/BEP demonstration in 3 key sectors and 6 enterprises: iron and steel, incineration and pulp and paper.

The Republic of Korea presented summaries of the unintentional POPs control programs and the ‘POPs Control Act’ enacted in 2008. In addition, the presentation also included the current status of unintentional POPs release facilities and estimated release amount to air by source categories.

Japan presented dioxins emission from specified metallurgical processes and the reduction measures for the steel manufacturing electric arc furnace. A co-benefits approach was stressed to reduce other pollutants and/or CO₂ emission as well as POPs.

The United States of America introduced two different approaches for laboratory simulations and field sampling to measure PCDD/PCDFs emissions from open burning of sugarcane in the United States of America and Australia. The presenter also showed examples of field sampling from waste dump sites in Mexico and People’s Republic of China for comparing the emissions measured there with those obtained by laboratory simulations in the United States of America and in Sweden.

During the discussion, a participant asked about the economic effect of BAT/BEP implementation in People’s Republic of China. The presenter stated the effectiveness of the BAT/BEP approach but also commented on

additional cost needed with the addition of advanced emission control to reduce unintentional POPs emissions. A request for detailed information about 'Voluntary Agreement' was given to Korean presenter. The presenter introduced the voluntary agreement to measure unintentional POPs release among cement manufacturers. In regard to the question on dioxin emissions from biomass open burning, the presenter from the United States of America added that excess production of dioxins might be related to the high chlorine concentrations in some of the biomass materials. A question on the production of dioxins in the blast furnace was posed to the Japanese presenter. The presenter replied that dioxins production is at a minimum level since the blast furnace system avoided the presence of chlorine. The presenter also pointed out that reduction of GHG was an equally important viewpoint along with the reduction of POPs. The presenter of the United States of America also added that since prevention of biomass open burning such as forest and bush fires result in preventing the high black carbon emissions which create significant greenhouse effect, as well as securing the CO₂ absorption by plants. The prevention of biomass open burning is not only important in the reduction of POPs but also in the mitigation prevention of global warming.

6. In session 3, six reports on "Knowledge for future efforts" were presented and discussed. Dr. Shinsuke Tanabe from Ehime University, and Dr. Heidelore Fiedler from UNEP Chemicals Branch, co-chaired the session.

The Lao People's Democratic Republic presented the current status of POPs situation, inventories and a national implementation plan of the country.

The Socialist Republic of Vietnam presented an inventory of unintentional POPs, an action plan to reduce unintentional POPs releases and capacity building.

The Kingdom of Thailand presented PCDD/PCDFs releases from different source categories and regulation of PCDD/PCDFs emissions and current and future efforts in reducing unintentional POPs that include the implementation of the national implementation plan (NIP) measures and the East and Southeast Asia (ESEA) regional BAT/BEP action plans.

The Republic of Singapore's presentation consisted of the control of POPs,

the national implementation plan and perfluorooctane sulfonate (PFOS). Japan presented the occurrence of polybrominated dibenzo-*p*-dioxin/dibenzofuran (PBDD/PBDFs), brominated flame retardants (BFRs) and PeCB as unintentional POP candidates. Governmental survey results were shown, which focused on the current status of PBDD/PBDFs and BFRs emission to the air and water systems from various sources in Japan. Additionally, Japan presented case studies on the behavior of PeCB during incineration of wastes and the contamination with PeCB as impurities in products.

The EU presented the Integrated Pollution Prevention and Control (IPPC) Directive, information exchange process on BAT (the so-called Sevilla Process), and permits for industrial/IPPC installations considering also the Stockholm Convention on Persistent Organic Pollutants and the Convention on Long-Range Transboundary Air Pollution (CLRTAP) with its protocols.

Each presentation was followed by a discussion. After the presentation by the Lao People's Democratic Republic, the presenter was asked regarding the availability of monitoring laboratories within the country. The presenter replied that laboratories for monitoring POPs were insufficient and that it was necessary to build capacities. The Socialist Republic of Vietnam was asked regarding monitoring data for open burning in the country. The presenter replied that there were some data on emission POPs from open burning on landfill. The Kingdom of Thailand estimated the annual amount of releases of PCDD/PCDFs on five vectors, and emphasized the importance of data regarding the products. The Republic of Singapore prepared new POPs, such as PFOS and some BFRs, according to the proposal by the Persistent Organic Pollutants Review Committee (POPRC). Japan pointed out the need to consider control of HBCD. The EU mentioned that there were some sanctions, such as fines, and official instructions in the IPPC Directive.

7. In addition to these sessions, an "Introduction of JICA Training Courses in Environmental Management Sector" was also presented. Mr. Masaru Kurimoto from JICA introduced the new official development assistance (ODA) scheme and JICA's approach in the environmental management sector: air pollution, water pollution, global warming, soil pollution and

waste management. Training programs to transfer Japanese expertise and experiences have been conducted since 1954, and the total number of participants now reached about 170,000. Lists of training courses to be held in Japanese fiscal year 2009 were also introduced.

8. The chair made a summary of the workshop in the closing session. During the 2-day workshop, participants became acquainted with one another, and information on the current situation, problems and countermeasures related to unintentional POPs in East Asian countries were shared between participants. Information exchange and discussion during the workshop is important for effective reduction of unintentional POPs in each country within the region. It was also pointed out that dissemination through related meetings, such as the COP4 in May 2009 or even in scientific meetings, of information and experience from East Asian countries can contribute to the global reduction of POPs. In consideration of the health of future generations and conservation of the world's wildlife, East Asian countries should further enhance measures against unintentional POPs. The chair recommended continuing efforts for discussion of East Asian countries through meetings such as this workshop, in order to contribute in the development of effective controls for POPs.

In the present workshop, presenters provided scientific and technical information, good case practices or projects and comprehensive measures against POPs. Understanding technical background, and learning good practices and measures from other countries will contribute to reduce unintentional POPs in the East Asian countries. The following three points can be summarized from the three sessions.

Firstly, there is still a shortage of information and capacity in East Asian countries regarding inventory and emission sources. Many countries, organizations and experts have actively promoted inventory development. In the presentations by UNEP and the United States of America approaches to measure emissions from open burning of waste and of biomass burning has been shown. This information and the emission factors will be provided to COP4 and to the Experts meeting to further develop the Standardized Toolkit for Identification and Quantification of Dioxin and Furan releases in December 2009. The Kingdom of Thailand and Cambodia have followed the UNEP policy of a five vector approach for inventory development which targets air, water, land, product and residue. Their experience supplies good information on East Asian countries.

Secondly, there are also needs for further information on HCB, PCB and new POPs recommended by POPRC. Emission factors for HCB and PCB reported were based on actual measurements. These values should be followed with more information. The Republic of Singapore has prepared new POPs such as PFOS and some BFRs as proposed by the POPRC. There is a possibility that East Asian countries will have the environmental burden of these new POPs due to the present and future industrial growth. New POPs monitoring for source emission and environmental status is essential in these regions. It has been recognized that the development of an inventory for new POPs may be a requirement in the future. East Asian countries are making efforts to establish and enforce regulations. For example, the Republic of Korea has established comprehensive legislation. Information on effective regulation and enforcement should be shared among all countries.

Lastly, the importance of a co-benefit approach or the integrated approach was pointed out by many countries. In the EU, Best Available Techniques REFerence documents (BREFs) have been developed under the IPPC Directive following the integrated approach. These documents are used in the permitting of large industrial installations in an integrated manner taking into account the IPPC Directive as well as the Stockholm Convention on Persistent Organic Pollutants and CLRTAP with its protocols. It was shown that a co-benefit and integrated approach is important for the development of integrated pollution prevention and control measures with respect to the emissions of unintentional POPs. Certain technologies such as activated carbon adsorption for metallurgical emission sources to air can contribute to reduce both GHG and POPs. Co-benefits are for the inventory development and emission reduction of unintentional POPs and mercury, GHG were suggested.