

Workshop 2 (synthesis): water pollution abatement within the industrial sector

S. Matsui* (Chairman), J. Oatridge (Co-Chair) and A. Blomqvist*** (Rapporteur)**

*Kyoto University, Graduate School, Environmental Engineering, Yoshida Sakyoku, Kyoto City 606-8501, Japan (E-mail: matsui@eden.env.kyoto-u.ac.jp)

**Severn Trent Plc, 2297 Coventry Road, Birmingham B26 3PU, UK (E-mail: jim.oatridge@severntrent.co.uk; jim.oatridge@stplc.com)

***Linköpings Universitet, Dept. of Tematic Studies, Campus Norrköping/ITUF, SE-601 74, Norrköping, Sweden (E-mail: anna.blomqvist@ituf.liu.se; a.blomqvist@kpmg.se)

Abstract This workshop aimed at demonstrating and discussing how effective abatement of water pollution can be achieved through introducing cleaner technologies, recycling and reuse of water, and implementing new public policy measures.

Keywords Enforcement; legislation; public awareness; technology

Workshop presentations

Prof. Jay Joo Hwa (invited speaker), Singapore, gave a presentation of the Asian Productivity Organisation's work to spread the concept of "Green Productivity" in the Asia Pacific region. The organisation has 19 member countries and promotes Green Productivity with the aim of accelerating sustainable socio-economic development through productivity improvements. The adoption of Green Productivity is meant to ensure profitability, quality of life and reduce environmental impacts of industrial operations.

Mr. Björn Brovik (invited speaker), Sweden, presented the environmental work of General Motors, among other places at the Mexico Ramos Arizpe Complex, which received the Stockholm Industrial Water Prize in 2001. Between 1997–2000 the unit in Mexico reduced its use of freshwater resources by 50 per cent and increased its production sevenfold. GM is also working on developing transport technology for the "hydrogen economy", i.e. cars run on hydrogen rather than petrol. In parallel, GM also develops clean diesel technology and hybrid vehicles.

Ms. Hu Haiping, China, gave a presentation on "Henan Province's Experiences in Applying Congress Supervision to Industry Wastewater Treatment". Through strong efforts on investigations and inspections on industrial sites, awareness raising and the closing down of 17,000 units, the Henan province government has achieved a substantial reduction of industrial wastewater effluents in the region. Among the remaining problems are low environmental awareness, the polluting economic structure of the industry (paper, leather, breweries), insufficient treatment (technology and investments) and few city sewage plants.

Ms. Saila Parveen, Bangladesh, gave a presentation on "Reviving the Buriganga – a Case Study on Abatement of Tannery Effluent in Dhaka". The "hotspot" Hazaribagh on the banks of River Buriganga hosts approximately 185 tanneries responsible for the serious contamination of the area, primarily by wastewater emissions containing chromium and

dyes. No treatment facilities exist and only 12 units out of 185 have an Environmental Clearance Certificate. To decrease polluting emissions, the construction of a Common Effluent Treatment Plant, CETP, has been proposed. Public awareness is high, expectations are great but a number of financial and institutional dilemmas still have to be worked out before the CETP may become reality.

Mr. Jean Foulquier, France, gave a presentation on “Conditions for the Connection of Industrial Effluents to Municipal Sewage Networks”. In Marseille, a large number of industrial units are connected to sewage treatment plants operated by the municipality. To reduce the problems connected with this organisational set-up, in-depth investigations of the industrial effluents were carried out. Around 10 per cent of the units were found to cause 90 per cent of the problems. Better control, the installation of pre-treatment plants and increased environmental awareness among industrialists will contribute to a better output of municipal treatment facilities.

Dr. Cecilia Tortajada, Mexico, gave a presentation on “Policy Failures to Control Industrial Water Pollution in Mexico”. The industrial sector of Mexico accounts for 8 per cent of total water use in the country, but only 1/3 of industrial units comply with existing legislation. Implementation and enforcement of the legislation is a major problem, as is the inconsistency between the three different legal complexes relevant for emissions to water. The inconsistencies encompass, for example, the criteria for evaluation of discharges and the criteria to establish fines for violations. In December 2001, all debts due to discharges of wastewater out of legislation were written off, leaving polluting industries with very weak incentives to improve.

The poster of **Mr. Jaime Plazas**, “Ultrafiltration Immersed Membrane Bioreactor (UIMBR) for Dairy Wastewater Reclamation and Reuse”, Israel, received the Best Poster Award. Additionally, very interesting posters were presented by **Mr. N.O. Magbagbeola**, Nigeria, **Mr. Sessa Srinivas Vutukuru**, India, **Ms. Raisa Taryanikova**, Uzbekistan, **Mr. Victor Samoylenko**, Ukraine, **Prof. Marins Klavins**, Latvia, and **Prof. M. Habibur Rahman**, Bangladesh. Moreover, the presentation in the plenary session by **Dr. Ashok Sharma**, India, formed the basis of the workshop.

Discussion

The presentations and following dialogue concerned mainly industrial pollution problems in developing countries. The workshop identified 3 key actors whose roles are crucial in solving the very serious problems that exist.

Governments need to create a stronger enforcement capacity to ensure a proper implementation of the environmental legislation in each country. This became particularly evident in the context of developing countries, where legislation may be insufficient and inconsistent as in Mexico, and where enforcing capacities are very weak, as in the cases presented from Bangladesh, India and Nigeria.

During the discussion two contributors commented on practices that had developed in Japan and the UK for the control and regulation of industrial discharges to watercourses. The UK operates discharge consent arrangements whereby the consent document sets out maximum discharge limits on quantity and quality (by individual substances) that are permitted to be released. Arrangements for regular review (i.e. every 2 years) of the consent were in place, as were inspection and monitoring regimes. Charges for the discharge, based on volume and strength, were levied, and penalties for non-compliance included fines, closure and in extreme cases imprisonment.

In Japan, discharge permission is required for any industrial effluent depending on the volume and quality of the waste water. Regular reporting on the discharged waste water quality to local authorities is required. Inspections of the discharge are conducted by local authorities. In cases where violations are serious, for example emission of toxic chemicals, police action is introduced and the responsible party penalised.

Mass-media need to give more coverage to environmental issues, including the environmental performance of individual industries, to increase public and consumer awareness and put stronger pressure on polluting industries and governments to take the problems seriously. Increased knowledge and awareness of local and global environmental problems caused by industrial pollution among the broader layers of the earth's population will contribute to putting these issues more clearly on the political and moral agenda. From China the example of mass-media coverage of inspection tours by authorities was presented (the "Zhongyuan Environmental Protection Travel" where 16 newspapers and broadcasting stations were invited to participate in an inspection tour).

Multinational corporations need to make stronger efforts to introduce clean technology and raise the standards of water use and treatment at their own operations globally. The leading businesses recognise that the use of lower standards in developing countries cannot be accepted. The larger corporations need to assist with spreading such approaches through the supply chain so as to also include smaller firms. The discussion also made clear that MNCs have the resources, knowledge and capacity to develop new and cleaner technologies, both regarding cleaner production processes and cleaner products (such as, for example, the hydrogen car under development by General Motors).