# Environmental Technology Assessment (EnTA)

## Manila, Republic of the Philippines
## 22 - 25 February 2000

# Workshop Report

United Nations
Environment Programme
Division of Technology,
Industry and Economics

The International
Lead Management
Center

Carl Duisberg
Gesellschaft

**WORKSHOP REPORT**

This document reports on the conduct and outcome of an International Workshop on Environmental Technology Assessment (EnTA), held in Manila, Republic of the Philippines, 22-25 February 2000.

For more information please contact:
United Nations Environment Programme
Division of Technology, Industry and Economics
Tour Mirabeau 39-43 quai André Citroën
75739 Paris Cedex 15, France
Tel: +33 1 44 37 14 50
FAX: +33 1 44 37 14 74
E-mail:unep.tie@unep.fr


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**Sponsors:**

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- Carl Duisberg Gesellschaft (CDG), Germany;
- Philippine Recyclers Inc., Republic of the Philippines;
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- UNCTAD – International Trade and Commodities Division, Trade, Environment and Development Section, Geneva Office, Switzerland.

The **Report** was prepared by John E Hay (John E Hay & Associates, Auckland, New Zealand)

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# EXECUTIVE SUMMARY

The United Nations Environment Programme (UNEP), in conjunction with the International Lead Management Centre (ILMC) and the Carl Duisberg Gesellschaft (CDG), convened a participatory training workshop designed to familiarise participants with the Environmental Technology Assessment (EnTA) process and to develop their understanding by engaging them in a practical application of the EnTA methodology, using automotive battery recycling as a case study. UNEP viewed the workshop as part of its efforts to encourage the uptake of EnTA, including training in, and evaluation of, its new environmental technology assessment (EnTA) Manual, *Anticipating the Environmental Effects of Technology*.

The 46 workshop delegates and other participants were drawn from a pool of government environmental officials, industrial process and environmental managers, and representatives of educational institutions and non-governmental organisations (NGOs) from the ASEAN region, and from selected countries in transition. Importantly, the workshop organisers achieved an appropriate mix of participants from the private sector, regulatory bodies, policy makers, educators and NGOs.

The workshop programme included presentations and discussions on environmental assessment techniques, the economics of sustainable environmentally sound battery recycling, construction and design of the modern recyclable lead acid battery, principles of hydro-metallurgical and pyro-metallurgical battery recycling, and the methods and practices of EnTA, as well as a practical, field-based assessment exercise in EnTA. Personal follow-up action plans were prepared by the trainees.

As a result of the workshop, 40 participants are now trained in the use of EnTA. Considerable progress was also made towards publication of an evaluated and revised EnTA Manual, ready for worldwide use by Governments and industry as a selection tool for sound environmental management of recycling and other processes, preparation of a model workshop, and publication of a trainers' manual. The workshop thus contributed to international advanced training, to dialogue and to human resources development, including international know-how transfer between North and South, and East and West.

Various aspects of the workshop were subject to a combination of formal and non-formal reviews and evaluations. Based on their knowledge and practical experience with EnTA (acquired both during and, in some cases, prior to the workshop), participants recognised the benefits of having an environmental management tool that is technology focussed. Importantly, EnTA identifies if more sophisticated assessment tools, such as environmental risk assessment and cost-benefit analysis, need be used to ensure that the appropriate environmental outcomes can indeed be achieved. Participants considered the

draft EnTA Manual to be comprehensive and thought it provided an understandable and useful introduction to EnTA and to the specific assessment procedures. However, the Manual needs to include a simple economic assessment. Some trainees expressed concerns about the subjective nature of EnTA, the lack of specific weighting procedures for aggregating impacts and explicit acknowledgement of uncertainties. However, most participants were comfortable that EnTA uses concepts and procedures consistent with

the need to reflect diverse human values, expert opinion and incomplete information and understanding.

A number of follow-up activities were identified in the personal action plans and in a post workshop review conducted by the organisers. EnTA will be further evaluated and applied in the various national situations, including different applications and approaches such as treatments, adaptation and innovation. Multi-sector training and consultation will also be undertaken and the policy environment for the implementation of EnTA will be developed in participating countries. Finally, EnTA will be refined in order to improve precision, and include financial and economic analyses.

The workshop, along with the similar workshop convened in South Africa, has provided substantial guidance for the revision of the EnTA Manual. While the preparation of the revised Manual in conventional form is already supported by UNEP, the goal of worldwide distribution and use of the Manual will come about only if more EnTA trainers are available and modern information dissemination methods such as CD ROM and the Internet are employed.

The experience acquired in implementing the Manila and South African workshops has resulted in identification of a number of ways in which the workshop structure, approach, content and methods might be modified in order to produce optimal outcomes. The stage is now set for the development of a "model workshop" and for the preparation of a trainers' manual, but further action is contingent on identifying, briefing and resourcing those who have the ability to complete such a task.

Finally, as a result of the workshop a series of important recommendations have been prepared:

***Recommendation 1:***

UNEP, in conjunction with its substantive partners such as ILMC, CDG and UNCTAD, continue to develop EnTA as a key environmental management tool, and facilitate the application of EnTA through the dissemination of information, including the revised Manual, and through the implementation of further training and other capacity building activities.

***Recommendation 2:***

Relevant international, regional and national organisations and institutions provide substantive and sustained support to the Manila workshop participants, in ways that will facilitate implementation of their personal action plans and ensure sustainable and

measurable impacts from the workshop, including facilitating their involvement in building regional and national capacities in EnTA.

***Recommendation 3:***

Appropriate organisations and institutions are encouraged to participate and collaborate in studies that will lead to a scientifically rigorous and operational definition of "environmentally sound and sustainable", and to the identification and application of measures (targets and indicators) to be used to quantify the increased uptake of environmentally sound technologies, and the benefits that arise;

***Recommendation 4:***

Build on the successful strategic alliances that were established and strengthened during the planning and implementation of the Manila workshop in order to:

- prepare, and disseminate worldwide, the revised and improved EnTA training materials, including case studies on:
  - lead acid battery recycling;
  - disposal of medical wastes; and
  - comprehensive comparison of existing and emerging lead acid battery processing technologies;
- support the work of regional and national centres engaged in environmental technology assessment and transfer; and
- replicate the EnTA training workshop approach in other institutions, countries and regions, and with reference to other process technologies.

***Recommendation 5:***

UNEP and its strategic partners to facilitate and coordinate a study of the implications on trade, and on sustainable development, of the increased use of environmentally sound technologies for the recycling of hazardous wastes.

# INTRODUCTION

The United Nations Environment Programme (UNEP), in conjunction with the International Lead Management Centre (ILMC) and the Carl Duisberg Gesellschaft (CDG), convened a participatory training workshop designed to familiarise participants with the Environmental Technology Assessment (EnTA) process and to develop their understanding by engaging them in a practical application of the EnTA methodology, using automotive battery recycling as a case study. UNEP viewed the workshop as part of its efforts to encourage the uptake of an emerging methodology for assessing the environmental and related impacts of industrial process, and other, technologies. To facilitate this uptake of EnTA, UNEP has prepared an environmental technology assessment (EnTA) Manual, *Anticipating the Environmental Effects of Technology*.

Part of the workshop programme was devoted to characterising and illustrating the importance of macro and micro economic factors in establishing the parameters for a viable and thereby sustainable industrial process.

EnTA is well suited to developing countries and those in transition as it facilitates selection of the "appropriate" technology, to suit the environmental (including social and economic) circumstances and priorities of the country or region. Hence there was particular value in conducting the workshop in South East Asia, and including several participants from other regions and countries in transition.

The Workshop targeted those working in industry, Governmental environmental, regulatory and trade agencies, and in non-governmental organisations. Such people are among those often required to assess the environmental impact of a range of technologies, or make discerning choices between various competing processes.

# FOCUS, OBJECTIVES AND OUTPUTS OF THE TRAINING WORKSHOP

The focus of the workshop was to assess the environmental and related performances of current and emerging technologies used in automotive battery collection and recycling sectors in Southeast Asia, particularly in the Philippines, including measures that enhance collection rates and avoid used batteries entering the waste stream.

The objectives of the workshop were to ensure that participants would:

- Understand the principles of economically viable and environmentally sound lead acid battery collection and recycling;
- Be able to use the methodology described in the Environmental Technology Assessment (EnTA) Manual, *Anticipating the Environmental Effects of Technology*, as a tool with which to evaluate the environmental soundness of technologies and of procedures in the secondary lead industry, with a special focus on used automotive lead acid battery collection and recycling; and

- Be capable of applying the lessons learned to assess the environmental impacts of a wider range of technologies.

Consistent with the above objectives, the outputs of the workshop were:

- 36 delegates and 4 other participants trained in the use of EnTA to evaluate the environmental impacts of process technologies, especially those related to recycling used lead acid batteries;
- Publication of an evaluated and revised EnTA Manual, ready for worldwide use by Governments and industry as a selection tool for sound environmental management of recycling and other processes; and
- Preparation of a model workshop, and publication of a trainers' manual that would facilitate replication of the workshop in other countries and regions, and focus on a range of process technologies.

To achieve these objectives extensive use was made of the simplified Environmental Technology Assessment (EnTA) Manual, *Anticipating the Environmental Effects of Technology*, prepared jointly by UNEP's Production and Consumption Unit and its International Environmental Technology Centre, both of UNEP's Division of Technology, Industry and Economics (DTIE).

Participants from governmental environmental and other agencies, from industry, educational institutions and non-governmental organisations, were trained in the use and application of EnTA, with battery recycling used as a case study. The newly acquired knowledge and skills were intended to provide the basis for participants to make valid assessments of the real and potential environmental performances of the chosen battery recycling processes and, where applicable, make recommendations regarding procedural and technology improvements to the industrial sector, in order to achieve higher levels of health and environmental protection. The workshop was also intended to give participants the opportunity to equip themselves with the methods, tools and materials they could use to conduct EnTA training courses in their domestic institutions and national organisations.

## BACKGROUND TO THE WORKSHOP

The potentially serious health and environmental impacts of inappropriate and