MoE UNEP SBC

NATIONAL WORKSHOP'S REPORT
ON
THE INVENTORY OF USED LEAD ACID BATTERIES IN CAMBODIA

13-14 May 2004, Juliana Hotel, Phnom Penh, Cambodia

Organized by the Ministry of Environment
Supported by SBC/UNEP

Prepared by the Project Team
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ACRONYMS AND ABBREVIATIONS

Art.	**Article**
ASEAN	**Association of South East Asian Nations**
BC	**Basel Convention**
BCG	**Basel Convention Guidelines**
BAT	**Best Available Technology**
CITES	**Convention on International Trade in Endangered Species of Wild Fauna and Flora**
CP	**Cleaner Production**
CUTS	**Customer Unity and Trust Society**
DAAL	**Department of Agronomy and Agricultural Land**
DoE	**Department of Environment**
DEPC	**Department of Environmental Pollution Control**
EEC	**European Economic Community**

EPHA	**Environmental Public Health Act**
ESM	**Environmentally Sound management**
HW	**Hazardous Waste**
GEF	**Global Environment Fund**
ILMC	**International Lead Management Center**
INTERPOL	**International Police**
KoC	**Kingdom of Cambodia**
LAB	**Lead Acid Battery**
LABs	**Lead Acid Batteries**
MAFF	**Ministry of Agriculture Forestry and Fishery**
MF	**Maintenance Free**
MFA&IC	**Ministry of Foreign Affair and International Cooperation**
MoH	**Ministry of Health**
MIME	**Ministry of Industry, Mine and Energy**
MoEF	**Ministry of Economic and Finance**
MoC	**Ministry of Commerce**
MoE	**Ministry of Environment**
MoI	**Ministry of Interior**
MT	**Million Tons**
MoU	**Memorandum of Understanding**
MPWT	**Ministry of Public Works and Transport**
NGOs	**Non- Governmental Organizations**
NAP	**National Action Plan**
Para.	**Paragraph**
PIC	**Prior Informed Consent**
PPWM	**Phnom Penh Waste Management**
RAPS	**Remote Area Power Supply**
RGC	**Royal Government of Cambodia**
RGP	**Royal Government Policy**
SBC	**Secretariat of the Basel Convention**
TIWR	**Toxic Industrial Waste Regulation**
TM	**Transboundary Movement**
TT	**Task Team**
UNCTAD	**United Nations Conference on Trade and Development**
UNDP	**United Nations Development Program**
ULAB	**Used Lead Acid Batteries**
UPS	**Uninterrupted Power Supply Units**
VAT	**Values Added Tax**

1.0 INTRODUCTION

1.1 Objectives of the Project

To undertake an analysis and assessment of used lead acid batteries (ULAB) in the Kingdom of Cambodia and requirement of environmental management sound. This project will include three main stages:

- A desktop study;
- Technical field assessment; and
- A National Workshop.

The results of the project will form the basis for the preparation of a National Plan for the Environmentally Sound Management (ESM) of used lead acid batteries.

Finally, the whole process will be used to provide technical and practical training to all stakeholders on the Environmentally Sound Management of ULAB in the Kingdom of Cambodia (KoC).

1.2 Objectives of the Workshop

Stakeholders will be presented with an outline of the Sound Management of ULAB under the terms of the Basel Convention (BC) and the Guidelines for the ESM of leaded waste.

The findings and conclusions of the desktop study and the field surveys will be presented and discussed with the delegates to the workshop.

Delegates and project team members will formulate the basis for a National Action Plan for the ESM of ULAB in the KoC.

2.0 .CEREMONIAL

2.1 Welcome Address by HE Chhann Saphan, Secretary of State for the Environment

Statement made by H.E. Chhann Saphan, Secretary of State of the Ministry of the Environment of Kingdom of Cambodia at the National Workshop on the Inventory of Used Lead-Acid Batteries in Cambodia, 13-14 May 2004 at Juliana, Phnom Penh, Cambodia.

Your Excellency Director General of the Ministry of the Environment,
Dr. Thanawat Junchaya, United Nation Environment Programme,
Mr. Brian Wilson, the International Expert of ILMC,
Distinguished delegates, Lady and Gentlemen,

This event, which was funded by the Secretariat of the Basel Convention (SBC), has provided the Cambodian Ministry of the Environment (MoE) an opportunity to host the National Workshop on The Inventory of Used Lead Acid Batteries in Cambodia, and this is a great day for us all.

Pic. 1: H.E. Chhann Saphan making his Opening Remarks and welcoming the participants to the workshop

On behalf of the Royal Government of Cambodia (RGC), the MoE and myself, it is a great pleasure to be here and I would like to express my sincere thanks and warmly welcome all of you representing the line ministries, NGOs and the Private sector attending the workshop today as invited by MoE. Your presence here is expressed firmly to support the current Royal Government Policy towards the economic development and poverty alleviation under the leadership of Samdech Hun Sen, the Prime Minister of the KoC, as indicated in the Second Socio - Economic Development and poverty alleviation under the leadership of Samdech Hun Sen, the Prime Minister of the KoC, as indicated in the Second Socio-Economic Development Plan 2001-2005 which provided high priority to natural resources maintenance and protection, and boosted the environmental quality in a better condition but for serving the socio-economic development in a sustainable manner.

Your Excellency, Distinguished delegates, Ladies and Gentlemen,

During two decades of civil war, especially under Pol Pot's Regime, human resources, infrastructure and much of the countries natural assets were destroyed, causing severe shortages in population and natural resources that normally play important role in societal development. Actually, the lack of human resources and public awareness are the main obstacles that impede the environmental protection plan and the natural resource conservation program. For example, the environmental and human health pollution caused by human activities without proper consideration for the consequences of such actions as the unregulated

disposal of solid waste and liquid effluent into the environment, the recycling of some types solid waste without proper environmental standards are causing direct or indirect harmful impacts to the environment and human health resulting in increase in poverty and hardship from day to day.

Seeing these critical problems, the RGC through the MoE and other concerned ministries has paid a great deal of attention, and used all means and mechanisms possible to either intercept, reduce and phase out all those activities that cause environmental destruction and public health impacts under the support and assistance of International Organizations and Non-Governmental Organizations (NGOs), especially, a full supports of the RGC.

To effectively achieve the implementation of the environmental and public health protection program, the RGC has already adopted environmental legal tools such as (i) Law on Environmental Protection and Natural Resources Management; (ii) Sub- Decree on Water Pollution Control; (iii) Sub-Decree on Solid Waste Management; (iv) Sub-Decree on Environmental Impact Assessment Process and other related statutes.

Dear Participants,

With the efforts just mentioned, Cambodia also became a signatory to the Conventions on the Biological Diversity, Convention on the Climate Change, Ramsa Convention, CITES Convention, Stockholm Convention, Vienna Convention and Basel Convention.

To fulfill the obligations under these conventions, Cambodia has been receiving full technical and financial supports from the Secretariats of those conventions or from supporting International organizations and NGOs in capacity building programs to strengthen the understanding of governmental officials as well as the planning of national activities focusing on environmental and human health protection according to the guidelines of the conventions.

Dear Excellency, Distinguished delegates, Ladies and Gentlemen,

The National Workshop on the Inventory of Used Lead Acid Batteries in Cambodia that has been organized today is an event that confirms the Secretariat of the Basel Convention's support for our program for the environmentally sound management of ULAB recovery and recycling in the KoC including the national action plan now under consideration.

During the course of this two day workshop I do hope that the discussions and exchanges between the concerned institutions, both public and private sectors will be fruitful and contribute to the expected outcome of the workshop. This means that comments and suggestions raised by all the participants will be considered for inclusion in the National Action Plan for effective ULAB recycling in Cambodia in accordance with international standards and sound management.

Before the end of my speech, I would like to express deep thanks to the SBC for providing the support for the workshop organization and to Dr. Thanavat Junchaya, representing the SBC, Mr. Brian Wilson, the International Expert from the ILMC and all distinguished participants that attend this workshop.

Finally, I would like to wish the workshop a successful and fruitful outcome.

I therefore open the National Workshop on the Inventory of ULAB in Cambodia.

Thank you

2.2 Keynote Speech by Dr. Thanavat Junchaya, UNEP/SBC Bangkok Regional Office

H.E. Chhann Saphan, Secretary of State for the Environment, distinguished guests, ladies and gentlemen.

On behalf of Mrs. Sacchiko Kuwabara-Yamamoto, Executive Secretary to the Basel Convention Secretariat and Mr. Surendra Shrestha, Regional Director and Representative for the UNEP Regional Office for Asia and the Pacific; it is my honour to be participating in the *National Workshop on "Used Lead Acid Battery Inventories in Cambodia".*

This workshop is one component of the project which has received funding under the 10 Year Strategic Action Plan for the BC and is regarded as an important project for the region, not only for the BC in the strictest sense, but also more generally in regards to trade and the environment. The project seeks to account for the inflows and outflows of Lead Acid Batteries (LAB) in Cambodia and the state of the recycling industry here. The main objective of this workshop is to disseminate the findings to key stakeholders and discuss ways forward to properly handling ULAB in KoC.

LABs are all around us and we couldn't live the life we enjoy in the 21st century without them. When the French scientist, Gaston Plante, invented the lead acid battery in 1859, he could not have envisaged the critical role his creation would play today in transportation, communication, and electrical utilities, and as emergency backup systems. However, I don't think he was aware of the dangers posed by lead either. We will not be able to live our life safely if we do not properly handle and dispose of ULAB. Improper disposal of LABs, such as being dumped in a landfill or an empty field can cause contamination of the environment and groundwater supply. With the fast growing economy of Cambodia, the use of lead acid batteries will only increase and thus the need to take appropriate action to handle this hazardous waste is now an urgent matter.

Pic. 2: Dr. Thanavat making the Keynote Speech to participants at the National Workshop

LABs used in most types of vehicles represent a significant portion of the hazardous waste (HW) stream. Each battery is constructed of a plastic shell containing several inner cells. Each inner cell encloses lead plates which are immersed in sulfuric acid. The average lead acid battery contains 8 to 14 kilograms of lead and 6.5 liters of sulfuric acid.

Lead is a highly toxic heavy metal. Severe lead poisoning can cause comas, convulsions, irreversible mental retardation, seizures and even death. Low levels of exposure can result in fatigue, impaired central nervous system functions and impaired hearing. Children are especially vulnerable to the effects of lead. Even relatively small amount of lead can cause permanent lowering of intelligence levels in children, potentially resulting in reading disorders, psychological disturbances, and mental retardation.

Sulfuric acid is corrosive, it "eats away" or dissolves materials and living tissue by chemical action. Batteries improperly disposed of as regular trash pose a danger to refuse collectors who can come into contact with sulfuric acid.

In developed countries, proper handling and disposal of LABs are considered to be the environmental success story of our time. In the United States (US), more than 97 percent of all battery lead is recycled. Compared to 55% of aluminum soft drink and beer cans, 45% of newspapers, 26% of glass bottles and 26% of tires, lead acid batteries tops the list of the most highly recycled consumer product. When a used battery is collected, it is sent to a licensed recycler where, under strict environmental regulations, the lead and plastic are reclaimed and sent to a battery manufacturer to be used to produce a new battery.

Unfortunately, the same thing cannot be said for the situation in many developing countries where environmental and workplace regulations are weak and/or not enforced. Poor practices such as discharging acid into waterways, dumping residual wastes outside properly gates are still common, even today.

The lack of regulations and weak enforcement along with the high cost complying with the environmental and occupational health regulations for operating lead battery recycling facilities in industrialized countries caused a massive flow of lead battery waste trade to developing countries, particular in Asia during the 1990s.

To protect human health and the environment, Cambodia must aim to achieve ESM of HW, which is the central goal of the BC. ESM means addressing the issue through an integrated life-cycle approach which involves strong controls from the generation of HW to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

The BC represents new forms, rules and procedures in law governing the movement and disposal of hazardous wastes (HW) at international as well as national levels. In this context, the BC represents the intention of the international community to solve this global environmental problem in a collective manner.

On behalf of the SBC, it is my hope that the national stakeholders take this unique opportunity to review the current situation of lead acid batteries in Cambodia and have a fruitful discussion on the most appropriate actions to manage lead acid batteries in an environmentally sound manner as prescribed under the regulatory system of the BC.

2.3 Closing Speech by H.E. Prach Sun, Under Secretary of State for the Environment

His Excellency, Dr. Thanavat Junchaya, the UNEP/SBC Representative, Brian Wilson, the SBC/ILMC expert, Distinguished National and International Guests, Lady and Gentlemen.

Today I have the immense delight to preside over the closing ceremony for the workshop on the *"Inventory of Used Lead Acid Batteries in Cambodia".*

<u>Pic. 3:</u> H.E Prach Sun, Under Secreatry of State for the Environment giving the closing Speech at the National Workshop

On behalf of the Minister, other Ministry Leaders and myself, I would like to take this opportunity to say a profound thank you to the SBC for providing Cambodia with the opportunity to undertake this project, and to thank Brian Wilson, the ILMC expert who provided such valuable assistance to the project task team. I would also like to express my sincere thanks to all the participants for spending their valuable time discussing and contributing their views and opinions during the scheduled program. I would also like to say that, quite frankly I admire the efforts made by the staff of the Department of the Environmental Pollution Control (DEPC) for conducting the workshop so successfully.

Excellency, distinguished national and international guests, lady and gentlemen, I have the honor to inform you that Cambodia is the first country in Asia that has been given the chance to accept a support project from the SBC. As we have inadequate human resources and a multitude of other environmental and human health concerns I firmly hope that Cambodia will get more support from the SBC after this scheduled project is finished.

National and International guests, lady and gentlemen your debate, discussion and recommendations made during the two-day workshop are very important and will provide the key tools in the preparation of a draft national action plan for managing and recycling ULAB based on the real situation in Cambodia. Furthermore, referring to the outcomes of the recent surveys and presentations arising from the project by the task team and both SBC experts, Dr. Thanavat Junchaya and Brian Wilson, I trust that your Excellency, Lady and Gentlemen will have a better understanding and awareness of the negative consequences resulting from unsound management of ULAB and the options available to us to intercept, mitigate and eliminate completely these adverse consequences.

Excellency, distinguished national and International guests, ladies and gentlemen, the summarized outcomes of the workshop presented by Mr. Chrin Sokha, Deputy Director of the DEPC emphasized that ULAB management and recycling in KoC still has more challenges and threats to the environment and public health, to overcome, especially for those who directly carry out these tasks without considering their health and safety. To progress with these above challenges, I would ask for your consideration of the recommendations I suggest that we all consider improving the environment and public health as follows:

- To increase the active participation from educational institutions, both public and private sectors, and local authorities in the application of sound management and recycling of ULAB.

- To conduct educational and dissemination programs aimed at environmental and human health maintenance and environmental protection through the Commune-Councils though close cooperation between ministries and line agencies so that we can minimize and phase out the adverse impacts resulting from occupations such as lead acid battery recharging/servicing/reconditioning, ULAB reuse/recycling and residue disposal.

- To promote and accomplish the implementation it is necessary to prepare and setup a national action plan, Guidelines or Directives through further discussions with key stakeholders.

- To follow up and monitor all activities relevant to occupations in the lead acid battery recharging/servicing/reconditioning sector, ULAB recycling, especially to ensure that the existing legal instruments are enforced and complied with.

- To assess and report to the Ministry Leaders and Senior Officers about any adverse effects caused by ULAB recycling activities in order to set up effective and reliable countermeasures where necessary.

Of course, I am very confident that the forthcoming national action plan for ULAB management and recycling will be fully supported by the Decision-makers and agreed by the other ministries.

Once more, I would like to thank deeply to SBC that supported this workshop as well as a profound thank you to Dr. Thanavat Junchaya, the UNEP/SBC representative; Brian Wilson, SBC/ILMC expert, Your Excellency, Lady and all the Gentlemen who have participated in this workshop.

I, finally, would declare the National Workshop for "The Inventory of Used Lead Acid Batteries in Cambodia" closed from this moment.

A thousand Thank You's.

3.0 WORKSHOP PRESENTATIONS

3.1 Introduction to the Basel Convention and the Obligations of Member Parties; Dr. Thanavat Junchaya, UNEP/SBC Bangkok Regional Office

3.1.1 Background of the Basel Convention

In the late 1980s, a tightening of environmental regulations in industrialized countries led to a dramatic rise in the cost of HW disposal. Searching for cheaper ways to get rid of the wastes, so called "toxic traders" began shipping HW to developing countries and to Eastern Europe where disposal cost were low and regulations either lacking or not enforced. When this activity was revealed to be, in many cases, "sham recycling", the international community realized that there was no global framework to control such dumping activities and outrage amongst the environmental community lead to the drafting of the BC for waste management which was first adopted in 1989.

3.1.1.1 International Law

Following recommendations of the 1981 Montevideo Meeting of Senior Government Officials Expert in Environmental Law, adopted by the UNEP Governing Council in 1982, UNEP initiated work with government experts to develop guidelines for environmentally sound management of hazardous wastes. Work was completed in 1985, and guidelines were adopted in 1987 by the UNEP Governing Council.

These guidelines are known as the Cairo Guidelines. When the Cairo Guidelines were adopted, the Governing Council asked the Executive Director to prepare a global legal instrument to control transboundary movements of such wastes and their disposal because of increasing awareness of uncontrolled movements of hazardous wastes particularly to developing countries.

This led to adoption of the BC on the Transboundary Movements of HW and their Disposal. Recently, UNEP has launched a program to advocate low- and non-waste technologies through its Cleaner Production (CP) Program.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted unanimously in 1989 by the 116 states participating in the Conference of Plenipotentiaries. UNEP convened the conference in Basel, Switzerland. The Final Act of the Basel Conference was signed by 105 states and the European Economic Community (EEC). As of January 1993, 53 states and the EEC had signed the Basel Convention. Fifty one countries ratified the Convention, which entered into force on May 5, 1992.

3.1.2 Goals of the Basel Convention

The main objectives of the Convention are:

- To reduce transboundary movements of hazardous wastes and other wastes to a minimum consistent with their ESM.
- To treat and dispose of HW and other wastes as close as possible to their source of generation in an environmentally sound manner.

- To minimize the generation of HW and other wastes (in terms both of quantity and potential hazard).

- The promotion of the ESM of waste materials and especially hazardous waste.

- To assist developing countries in ESM of hazardous and other wastes they generate. An integral part of implementing the BC is building the capability to manage and dispose of HW. Through training and technology transfer, developing countries gain the skills and tools necessary to properly manage their hazardous wastes.

3.1.3 Definition of Waste

In the context of transboundary movements, the BC defines wastes as "substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law" (Article 2, paragraph 1).

3.1.3.1 Which Wastes are Covered by the Convention?

a) Under the BC the following wastes, subject to a transboundary movement, are defined as hazardous wastes if:

- The wastes belong to any category (Y1-Y45) contained in Annex I of the Convention.
- Exhibit one or more of the characteristics (H3-H33) contained in Annex III of the Convention.

b) Wastes that are not covered under subparagraph (a) above but are defined as or are considered to be HW by the domestic legislation of the Party of export, import or transit shall be controlled under the terms of the Convention.

c) For the purpose of the Convention, wastes that belong to any of the two categories Y46 and Y47 of Annex II to the Convention, subject to a transboundary movement, are defined as "other wastes" and will be controlled by the Convention.

Wastes which, as a result of being radioactive, are subject to other international control systems, including international instruments, applying specifically to radioactive materials, and wastes which derive from the normal operations of a ship, the discharge of which is covered by another international instrument are excluded from control.

3.1.3.2 Why Are ULAB Classified as a H W?

One of the most important characteristics is that the LAB - is "used" and destined for disposal under Article 2 definitions. Under Annex I, ULAB are classified as Y31 (lead; lead compounds) and Y34 (Acidic solutions or acids in solid form) wastes. Under Annex III ULAB include the following Hazardous characteristics H5.1 through to H13. Under Annex VIII it is classified as A1020 (see Basel Guidelines on ULAB for more details on toxicity). ULAB are a priority waste stream identified under the Strategic plan for the implementation of the BC to 2010

3.1.3.3 What Movements are Controlled by the Convention?

Transboundary movements are controlled by the Convention and they are defined as follows:

Definition: "Transboundary movement" means any movement of HW or other wastes from an area under the national jurisdiction of one State to or through an area under the national jurisdiction of another State or to or through an area not under the national jurisdiction of any State, provided at least two States are involved in the movement (Article2, paragraph 3, of the Convention).

3.1.3.4 Transboundary movements pursuant to bilateral, multilateral and regional agreements

The provisions of this Convention do not and shall not affect transboundary movements which take place according to bilateral, multilateral or regional agreements, provided that such agreements are compatible with the ESM of HW and other wastes as required by the Convention" (Article 11, paragraph 2). Parties shall notify the Secretariat of any such agreement that they enter into regarding transboundary movement of hazardous or other wastes, as well as "those which they have entered into prior to the entry into force of this Convention for them, for the purpose of controlling transboundary movements of HW and other wastes which take place entirely among the Parties to such agreements.

3.1.4 Obligations of the Member Parties

3.1.4.1 Competent authorities and focal points

"Competent authority" means one governmental authority designated to be responsible for receiving the notification of transboundary movements of HW or other wastes, and for responding to such a notification.

"Focal point" means the entity responsible for receiving and submitting information about waste materials. Cambodia has to "designate or establish one or more competent authorities and one focal point" and "inform the SBC" of such designations.

3.1.4.2 General obligations

Parties exercising their right to prohibit the import of hazardous wastes or other wastes for disposal shall inform the other Parties of their decision. Each Party shall "prevent the import of HW and other wastes if it has reason to believe that the wastes will not be managed in an ESM. HW or other wastes shall not be imported from a non-Party. Notwithstanding that provision, Parties may enter into bilateral, multilateral, or regional agreements or arrangements regarding transboundary movement of HW, provided that, such agreements or arrangements do not derogate from the ESM of HW and other wastes as required by this Convention. Each Party shall ensure that persons involved in the management of HW or other wastes within it take such steps as are necessary to prevent pollution and that all persons under its national jurisdiction will be prevented from transporting or disposing of HW or other wastes unless such persons are authorized or allowed to perform such types of operations.

HW and other wastes that are to be the subject of a transboundary movement must be packaged, labeled, and transported in conformity with recognized international rules and standards.

3.1.4.3 Country of import

The State of import shall respond to the notifier in accordance to the notification procedure.

3.1.4.4 Country of export

States shall engage in the transboundary movement of hazardous or other waste only if there does not exist a more environmentally sound alternative and even then the export must be in accordance with the provisions of the Convention.

The States of export shall inform the competent authority of the State of import of any intended transboundary movement of hazardous or other wastes, in accordance to the notification procedure, that is PIC, and that transboundary movement will not commence until it has received the necessary notification.

Country of transit Party to the Convention

After receiving the notification, the State of transit, which is a Party must reply in accordance to the notification procedure under PIC.

3.1.4.5 Designation of Competent authorities and Focal Points

To facilitate the implementation of this Convention, the Parties shall:

- Designate or establish one or more competent authorities and one focal point. One competent authority shall be designated to receive the notification in case of a State of transit.

- Inform the Secretariat, within three months of the date of the entry into force of this Convention for them, which agencies they have designated as their focal point and their competent authorities.

- Inform the Secretariat, within one month of the date of decision, of any changes regarding the designation made by them under paragraph 2 above.

3.1.4.6 General Obligations

a) Parties exercising their right to prohibit the import of HW or other wastes for disposal shall inform the other Parties of their decision pursuant to Article 13.

b) Each Party shall prevent the import of HW it the Party believes that the waste will not be managed in an environmentally sound manner.

c) A Party shall not permit HW or other wastes to be exported to a non-Party or to be imported from a non-Party.

d) Ensure that persons involved in the management of HW or other wastes with it take such steps as are necessary to prevent pollution due to HW and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment.

e) Parties shall prohibit or shall not permit the export of HW and other wastes to the Parties which have prohibited the import of such wastes, when notified pursuant to subparagraph (a) above.

f) Parties shall prohibit or shall not permit the export of HW and other wastes if the State of import does not consent in writing to the specific import, in the case where that State of import has not prohibited the import of such wastes.

g) Prohibit all persons under its national jurisdiction from transporting or disposing of HW or other wastes unless such persons are authorized or allowed to perform such types of operations.

h) Require that HW or other wastes that are to be the subject of a transboundary movement be packaged, labeled, and transported in conformity with generally accepted and recognized international rules and standards in the field of packaging, labeling, and transport, and that due account is taken of relevant internationally recognized practices.

i) Require that HW and other wastes be accompanied by a movement document from the point at which a transboundary movement commences to the point of disposal.

3.1.5 Control System for Transboundary Movements

The Control System for Transboundary Movements is base on Prior Informed Consent (Article 6).

The State of export shall notify, or shall require the generator of exporter to notify in writing, through the channel of the competent authority of the State of export, the competent authority of the States concerned of any proposed transboundary movement of hazardous wastes or other wastes. Such notification shall contain the declarations and information specified in Annex V A, written in a language acceptable to the State of import. Only one notification needs to be sent to each State concerned. The State of export shall not allow the generator or exporter to commence the TM until it has received written confirmation that:

- The notifier has received the written consent of the State of import.

- The notifier has received from the State of import confirmation of the existence of a contract between the exporter and the disposer specifying environmentally sound management of the wastes in question.

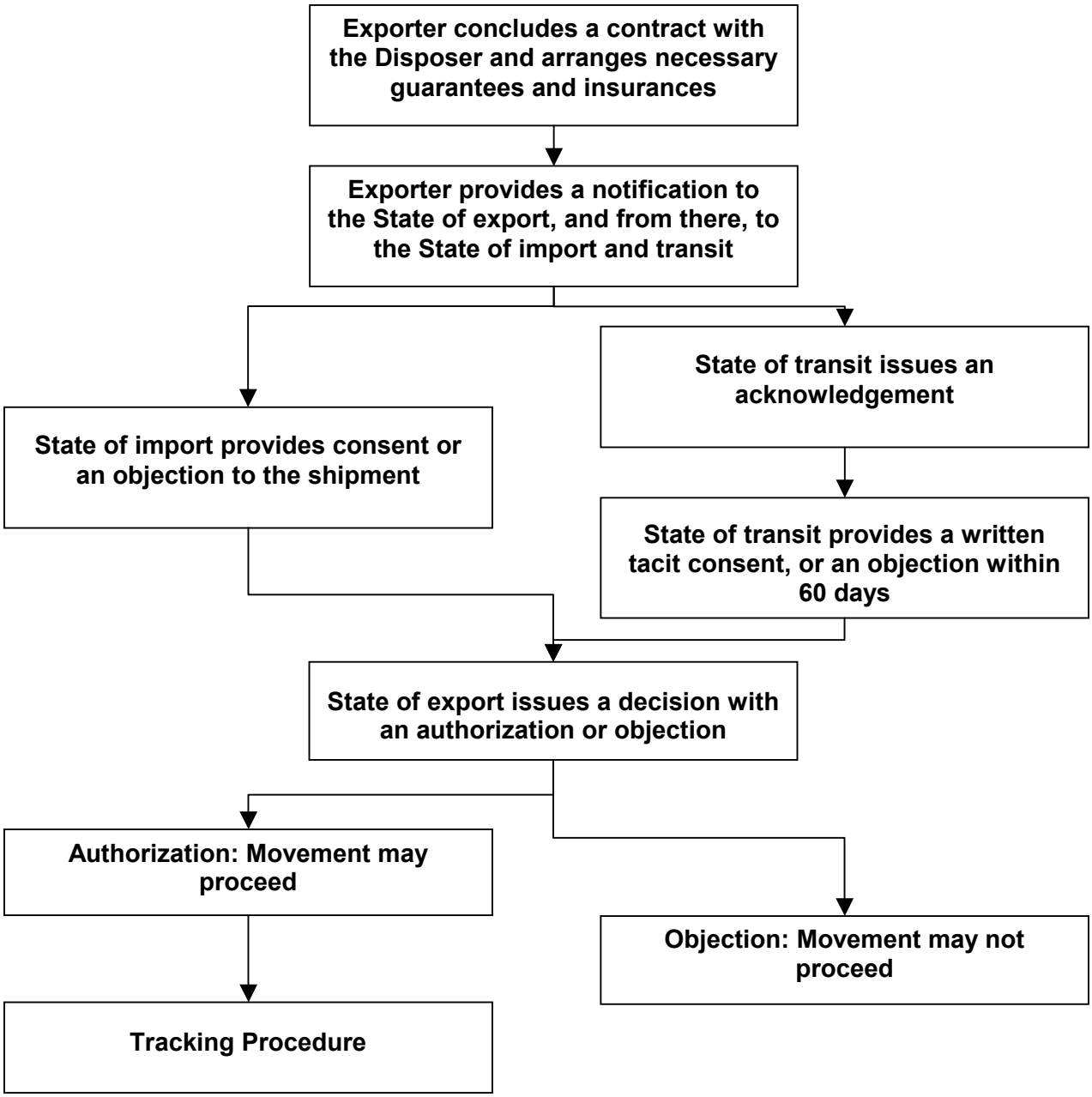
The State of import shall respond to the notifier in writing, consenting to the movement with or without conditions, denying, permission for the movement, or requesting additional information. A copy of the final response of the State of import shall be sent the competent authorities of the States concerned which are Parties.

Each State of transit which is a Party shall promptly acknowledge to the notifier receipt of the notification. It may subsequently respond to the notifier in writing, within 60 days, consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information.

Each Party shall "Require that hazardous wastes and other wastes be accompanied by a movement document from the point at which a transboundary movement commences to the point of disposal" (Article 4, paragraph 7 (c)) Article 6, paragraph 9 states that "the Parties shall require that each person who takes charge of a transboundary movement of hazardous wastes or other wastes sign the movement document either upon delivery or receipt of the wastes in question".

When a transboundary movement of HW or other wastes to which the consent of the States concerned has been given, subject to the provisions of this Convention, cannot be completed in accordance with the terms of the contract, the State of export shall ensure that the wastes in question are taken back into the State of export, by the exporter, if alternative arrangements cannot be made for their disposal in an ESM, within 90 days from the time that the importing State informed the State of export and the Secretariat, or such other period of time as the States concerned agree" (Article 8).

3.1.6 Notification and Authorization Procedure



Pic. 4: ***Notification and Authorization Procedure toward the Basel Convention***

The notification and response required by this Article shall be transmitted to the competent authority of the Parties concerned or to such governmental authority as may be appropriate in the case of non-Parties (Article 6, paragraph 10).

State of import's written consent and confirmation of contract for sound management of wastes must be issued in writing.

Any transboundary movement of HW or other wastes shall be covered by insurance, bond or other guarantee as may be required by the State of import or any State of transit which is a Party (Article 6, paragraph 11).

The State of export shall notify, or shall require the generator of exporter to notify in writing, through the channel of the competent authority of the State of export, the competent authority of the States concerned of any proposed transboundary movement of HW or other wastes.

Each State of transit which is a Party shall promptly acknowledge to the notifier receipt of the notification. It may subsequently respond to the notifier in writing, within 60 days, consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information. In the event that the Party is not satisfied, it will raise an objection to the movement.

The State of export will then proceed to issue an authorization to permit the TM of the HW and similarly in the event that the Party is not satisfied, it will raise an objection to the movement, otherwise it will proceed.

3.1.7 Tracking Procedure

Step 1 – Conclude a contract with the exporter. (See Appendix 6 for the basic elements to be included in the contract.)

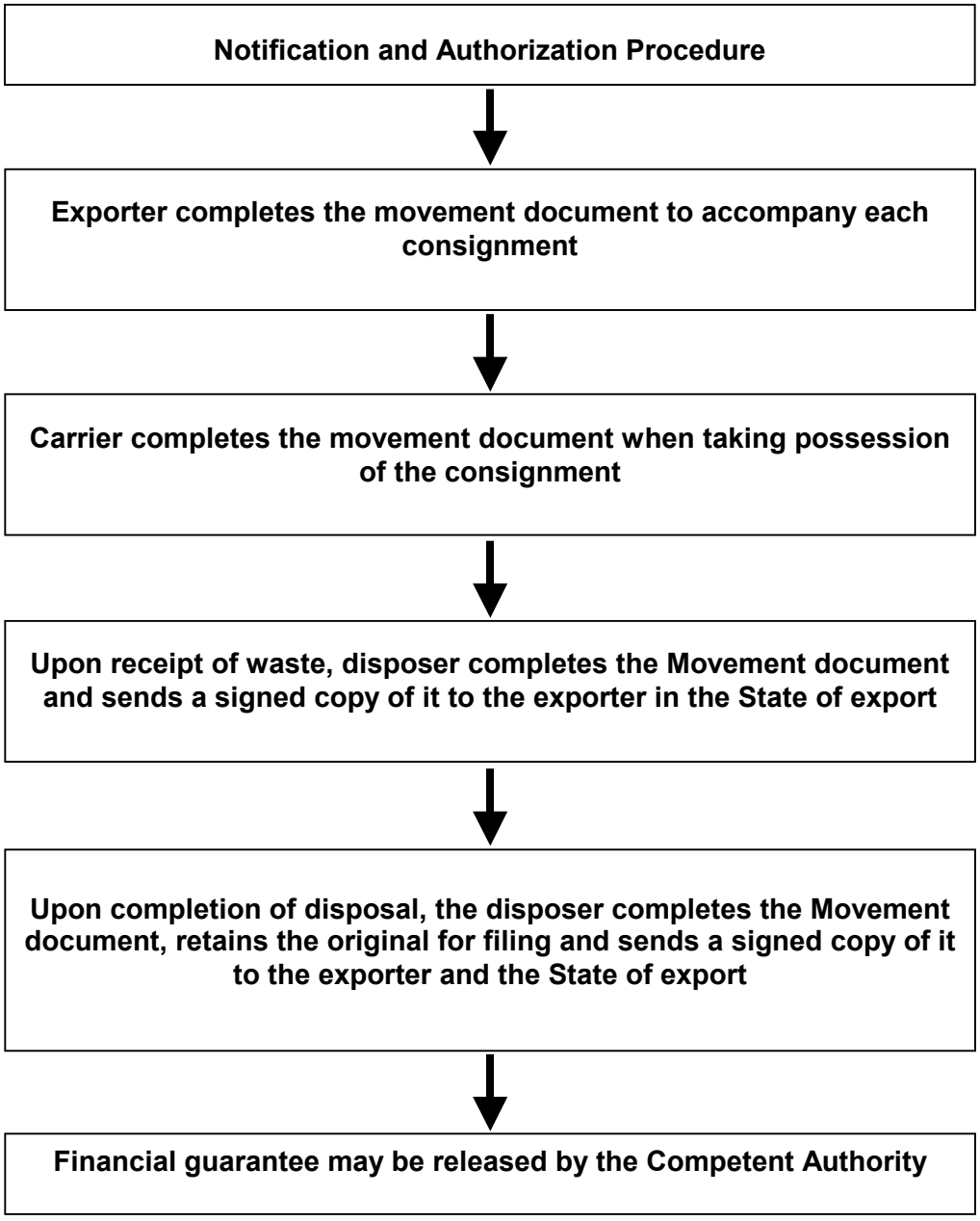
Step 2 – Provide the necessary information, for example, on the disposal processes, to the exporter/generator in order to facilitate the completion of the notification and movement document.

Step 3 –Ensure that the exporter/generator notifies the competent authorities of the State of export and State of import and each State of transit, if any, of the intended movement of waste in accordance with the BC. The notification may cover several shipments of wastes over a maximum period of one year, if waste having the same physical and chemical characteristics is intended to be regularly shipped to the same disposer via the same customs offices for entry and exit (general notification).

Step 4 – Upon receipt of waste, weigh the amount of waste and check, if necessary by testing and sampling, whether the consignment complies with the notification and contract. Complete the movement document and give a copy of it to the last carrier. Send signed copies of the completed movement document to the exporter and the competent authority of the State of export, and retain the original for filing.

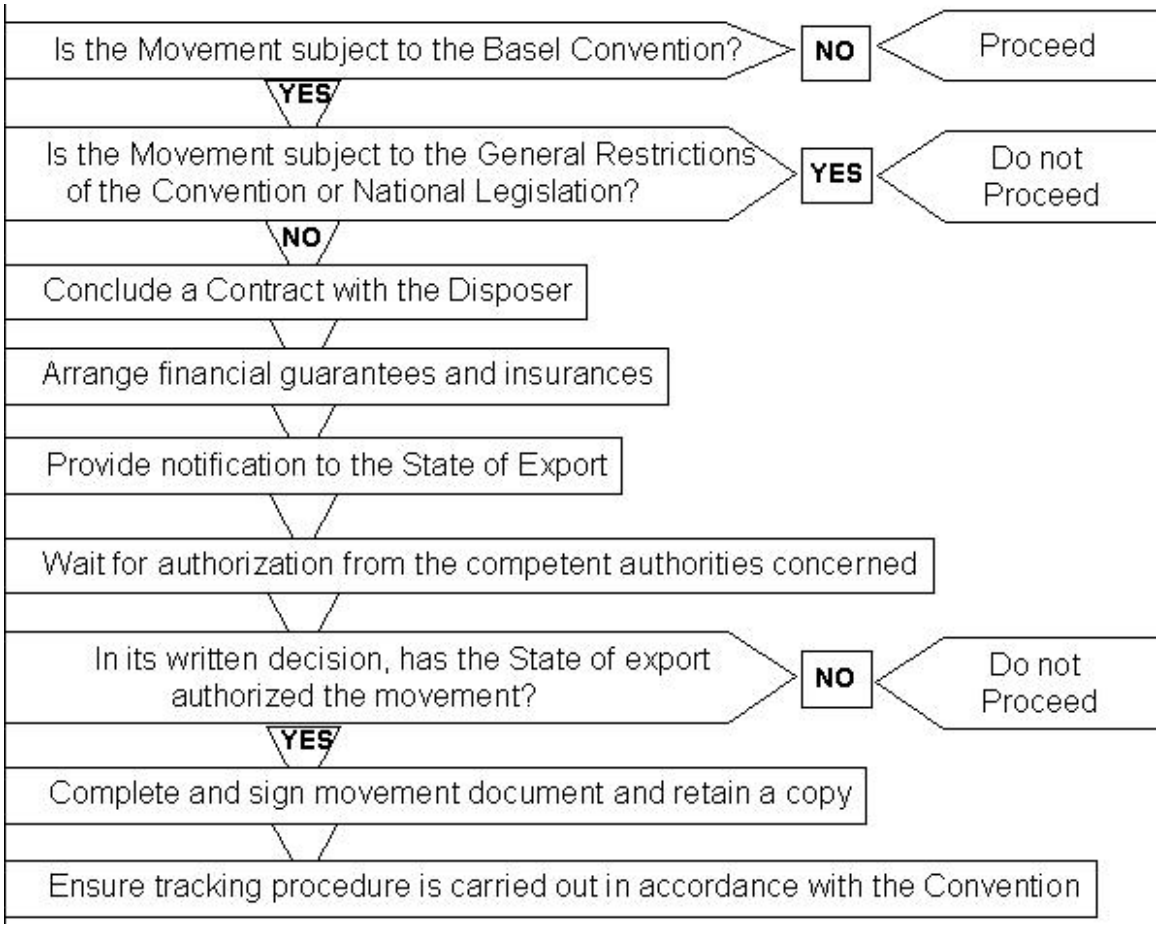
Step 5 – After the consignment of waste has been disposed of in an environmentally sound manner, complete the movement document by certifying that the disposal of waste has been completed. Send signed copies of the movement document to the exporter and the competent authority of the State of export, and retain the original for filing.

Step 6 – Then and only then can the Financial Guarantees be released by the competent authority.



Pic. 5: Tracking Procedure toward the Basel Convention

3.1.8 Responsibilities of Exporters



***Pic. 6*: Responsibility of Exporters**

Step 1 – Check if the material intended for transboundary movement is subject to the control procedures under the BC

- Is the material considered as waste? (ref. section 2.1)
- Is the waste subject to the control procedures under the BC?

Step 2 – Check if the intended movement can be carried out in accordance with the BC and the national legislation of the concerned countries.

If it is evident to the exporter that the intended movement of waste cannot be carried out in accordance with the BC or the national legislation of the concerned countries, it is advisable not to proceed with the notification procedure.

Step 3 – Contact the competent authority of the State of export.

Contact the competent authority of the State of export in order to get the notification and movement document and all the relevant information concerning the notification and tracking procedures.

Step 4 – Conclude a contract with the Disposer.

Step 5 – Arrange the financial guarantees and insurances.

Arrange the necessary financial guarantees and insurances for the movement of waste required by the national legislation of the countries concerned. Some countries may require the financial guarantee to cover the cost of any necessary re-import and alternative disposal operations should the need arise, including cases referred to in Articles 8 and 9 of the BC. Additionally, they may require separate insurance against damage to third parties, held as appropriate by the exporter, carrier and the disposer.

Step 6 – Acquire all necessary information.

Step 7 – Complete the notification

Make the necessary number of signed copies of the completed notification for:

- the competent authority of the State of export,
- the competent authority of the State of import and
- the competent authority of each State of transit, if any.

Step 8 – Wait for the authorizations from the competent authorities:

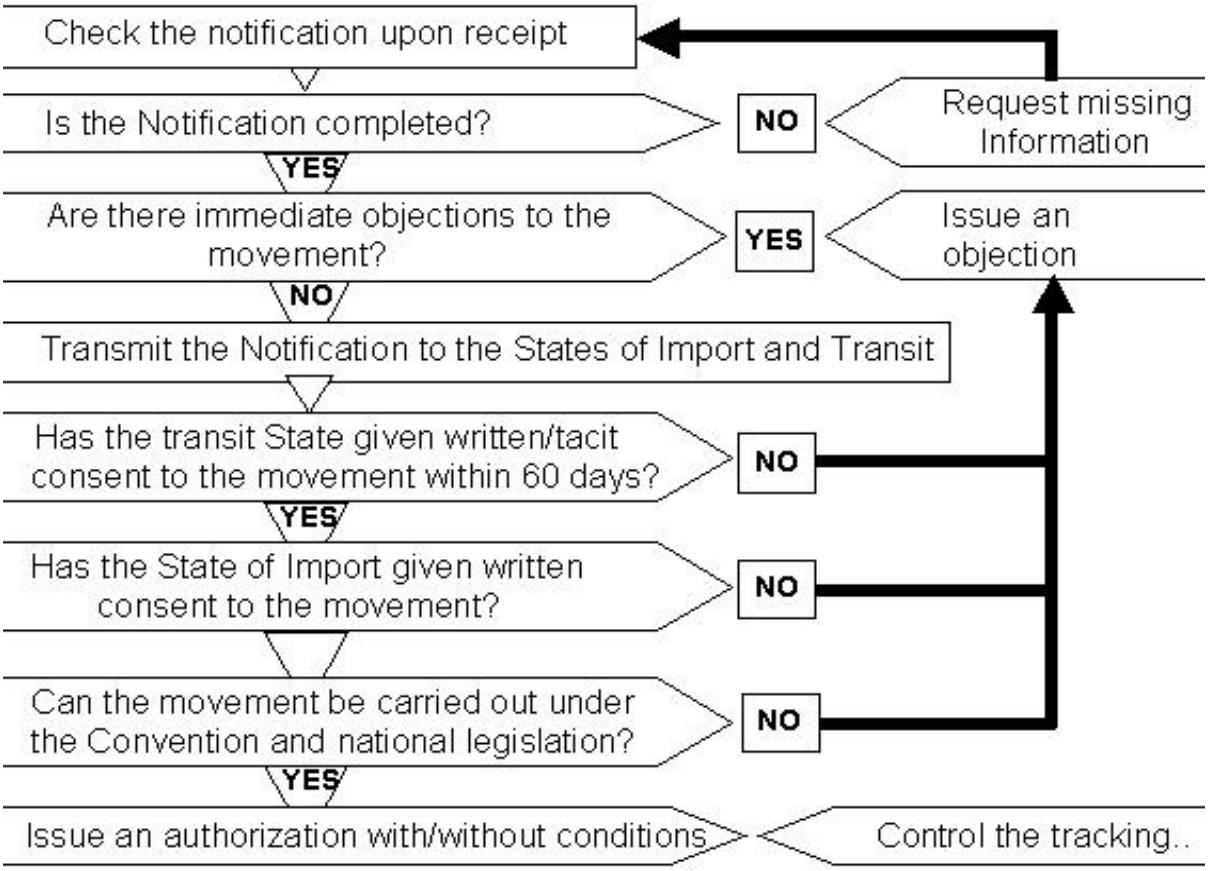
The movement of waste may commence only upon receipt of the authorization by the competent authority of the State of export consenting to the movement. This authorization can be given only if the competent authority of the State of import has issued its written consent to the movement and the competent authorities of transit, if any, have consented to the movement in accordance with Article 6(4) of the BC (see section 5.6).

Step 9 – Complete a movement document to accompany each the waste

Complete the movement document in accordance with the instructions. A completed movement document shall accompany each shipment. It is also recommended to enclose a copy of the notification with the movement document. Retain a copy of the movement document.

Step 10 – Follow Tracking Procedure.

3.1.9 Responsibilities of the Competent Authority of the State of Export



***Pic. 7*: Responsibility of the Competent Authority of the State of Export**

Step 1 – Determine whether the waste is subject to control under the BC:

- Is the material considered as waste (ref. section 2.1)?
- Is the waste considered to be subject to the control procedures under the BC (ref. section 2.2)?

Step 2 – Distribute forms to exporter/waste generator Step 3 Check the notification

Check if the notification is duly completed. If not, return the notification to the exporter/generator and ask that the missing information be provided. The competent authority may decide not to proceed with the notification if it has immediate objections.

Step 4 – Transmit the notification to other competent authorities

If the notification has been duly completed and there are no immediate objections to the movement, transmit copies of the notification to:

- The competent authority of the State of import
- Each competent authority of the State of transit, if any.

Step 5 – Ensure that the movement is allowed by the competent authorities of the States of transit.

Find out whether the State of transit has decided not to require prior written consent for transit of the waste concerned. If not required, the competent authority of the State of transit shall have 60 days after receipt of the notification to object to the proposed transit of waste. If no objection has been lodged, the State of export may allow the movement to proceed through the State of transit after the 60-day period has passed. In case prior written consent is required, the competent authority of the State of transit shall issue a written response to the notifier within 60 days following receipt of the notification.

Step 7 – Ensure that the movement is allowed by the Competent Authority of the State of import.

Ensure that the competent authority of the State of import has issued its written response and has confirmed the existence of a contract between the exporter, that the movement does not contravene national legislation and the movement has been authorized.

Step 8 – Issue a decision in writing.

Issue a decision consenting to the movement with or without conditions, denying permission for the movement or requesting additional information. The proposed movement can be authorized only in the absence of objections from the competent authority of the State of export and on the part of the other competent authorities concerned. In the case of a general notification, authorization can be given for a maximum period of one year.

Step 9 – Follow the Tracking Procedure

3.1.10 Transboundary Movements – Control Systems – Prohibitions

a) Any Party shall not permit the export and/or import of HW involving a State that is not a Party to the Convention (Art. 4, para. 5), unless the Parties concerned have concluded bilateral, multilateral or regional agreements or arrangements pursuant to Article 11 of the Convention that set forth the conditions under which the transboundary movement is to be carried out. Those conditions shall not be less environmentally sound than those provided by the Convention in particular taking into account the interests of developing countries.

b) Parties shall prohibit the export of HW to any such Party which has used its sovereign right referred to in Article 4, paragraph 1(a) of the BC to prohibit the import of foreign hazardous wastes and other wastes into its territory (Art. 4, para. 1-2).

c) Exports of HW for disposal to the area of 60^{o} South latitude (i.e. Antarctica) (Art. 4, para. 6).

d) Each Party shall prevent the export of HW if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner (Art. 4, para. 2 e).

3.1.10.1 Transboundary Movements – Illegal Traffic

An Illegal Movement of HW occurs when any transboundary shipment is made:

a) Without notification consistent with the provisions of the Convention to all States concerned;

b) Without the consent under the provisions of the Convention of a State concerned;

c) With consent obtained from States concerned through falsification, misrepresentation or fraud; or

d) Does not conform in a material way with the documents; or

e) Results in deliberate disposal (e.g. dumping) of HW or other wastes in contravention of the Convention and of the general principles of international law.

3.1.10.2 Transboundary Movements – Action Points

Parties should consider that illegal traffic in HW or other wastes is a criminal offence (Article 4, paragraph 3) and should introduce appropriate national/domestic legislation to prevent and punish illegal trafficking. (Article 9, paragraph 5).

In those cases of where there is illegal traffic in HW as the result of conduct on the part of the exporter or generator, the State of export shall ensure that the wastes in question are:

a) Taken back by the exporter or generator or, if necessary, by itself into the State of export, or, if impracticable;

b) Are otherwise disposed of in accordance with the provisions of this Convention in an ESM and within 30 days from the time the State of export has been informed about the illegal traffic or such other period of time as States concerned may agree" (Article 9, paragraph 2).

If the traffic is deemed illegal "as the result of conduct on the part of the importer or disposer, the State of import shall ensure that the wastes in question are disposed of in an environmentally sound manner by the importer or disposer or, if necessary, by itself within 30 days from the time the illegal traffic has come to the attention of the State of import or such other period of time as the States concerned may agree" (Article 9, paragraph 3).

In cases where the responsibility for the illegal traffic cannot be assigned either to the exporter or generator or to the importer or disposer, the Parties concerned or other Parties, as appropriate, shall ensure, through cooperation, that the wastes in question are disposed of as soon as possible in an environmentally sound manner either in the State of export or the State of import or elsewhere as appropriate" (Article 9, paragraph 4).

3.1.10.3 Transboundary Movements – Illegal Traffic – Action Points

Enforcement is central to the effective implementation of the BC. Although it may seem a straightforward activity, it is complex because of its multidimensional requirements. There is a need for:

- A proper infrastructure to maintain enforcement capability.

- Adequate staffing of trained personnel with appropriate logistical support, such as manuals and instructions.

- Strong inter-ministerial consultation and cooperation, MoE, MoI, and Customs.

- From an operational point of view, a properly integrated national enforcement program would consistently include: tracking of HW shipments; visits to company sites; transport control/checks/inspections; sampling and testing; information exchange.

- Such integration should also lead to the use of approved forms for every stage of the control of HW.

- Every case where an illegal movement is proven should be reported to the SBC.

3.1.10.4 Transboundary Movements – Illegal Traffic – Guidance

The instances of illegal trafficking of HW can be minimized and eventually eliminated if all those concerned parties responsible for the TM of HW have a comprehensive understanding of all the procedures necessary to authorize the movements, documentation is checked during transit and after disposal.

In most cases, it is necessary for Governments to run National Capacity building programs and to seek cooperation from the International community.

Undoubtedly the most effective measures are those designed to prevent illegal TM. Such measures require careful scrutiny of documents, investigation of any irregularities and management systems to ensure that suspect cargos are detected and intercepted.
Success will depend on regular monitoring of TM and intelligence about the source of any HW and knowledge about the treatment plants at the places of disposal or recycling. Data and information needs to be gathered, collated, analysed and shared through the Regional Centers for Training and Technology Transfer.

A firm response to violations is necessary to deter future violations. In addition, since detection is difficult in many cases, penalties must be costly to provide strong disincentives to other potential violators. It is essential that transporting companies or *countries* to take back the illegal shipment of HW and clean-up any contamination caused by the HW. The SBC promotes the use of criminal law to penalize violators.

International cooperation on enforcement activity is also increasing, primarily through initiatives of INTERPOL and the creation of databases of criminal activity that will aid nations to identify exporters with a history of hazardous waste violations and other related illegal activities.

3.1.11 Environmentally Sound Management of Hazardous Waste

A central goal of the BC is "environmentally sound management" , the aim of which is to protect human health and the environment by minimizing HW production whenever possible. ESM means addressing the issue through an "integrated life-cycle approach", which involves strong controls from the generation of HW to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

Environmentally Sound Management of Hazardous Waste

ESM of HW or other wastes means taking all practicable steps to ensure that HW or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes if they are not handled and processed correctly. (Article 2. 8)

Each Party shall require that HW or other wastes, to be exported, are managed in an environmentally sound manner in the State of import or elsewhere. Technical guidelines for the ESM of wastes subject to this Convention shall be decided by the Parties at their first meeting and used by the Parties to achieve ESM for HW. (Article 4. 8.)

The Basel Declaration on ESM made in 1999 and the Strategic Plan adopted in 2002 reaffirming the objectives set out in the BC and provide a stronger mandate for achieving ESM through waste minimization and by making the management of HW and other wastes accessible to all Parties, through international cooperation, partnerships with industry and capacity-building.

Environmentally Sound Management of Hazardous Waste

There are a number of principles that many countries have used to varying extents in developing their waste management strategies.

The Self-sufficiency Principle – by which countries should ensure that the disposal of the waste generated within their territory is undertaken there by means which are compatible with ESM, recognizing that economically sound management of some wastes exported may also be environmentally sound.

The Proximity Principle – by which the disposal of HW must take place as close as possible to their point of generation, recognizing that economically and ESM of some wastes will be achieved at specialized facilities located at greater distances from the point of generation;

The Least Transboundary Movement Principle – by which TM of HW should be reduced to a minimum consistent with efficient and ESM.

The Polluter Pays Principle – by which the potential polluter must act to prevent pollution and those who cause pollution pay for remedying the consequences of that pollution;

The Principle of Sovereignty – under which every country shall take into account political, social and economic conditions in establishing a national waste management structure.

The Integrated Life-cycle Principle – by which substances and products should be designed and managed to minimize environmental impact.

The Precautionary Principle – whereby preventive measures are taken, considering the costs and benefits of action and inaction, when there is a scientific basis, to believe that release to the environment of substances, waste or energy is likely to cause harm to human health or the environment;

The Integrated Pollution Control Principle – which requires that the management of HW should be based on a strategy which takes into account the potential for cross media and multi-media synergistic effects;

The Standardization Principle – which requires the provision of standards for the ESM of HW at all stages of their processing.

May 2004

3.2 Basel Guidelines for the Environmentally Sound Recovery of ULAB; Brian Wilson, ILMC

Technical Guidelines for the ESM of LAB Wastes were adopted by the Conference of the Parties (COP) in December 2002.

Section 3.2 deals with Collecting ULAB and the guidelines advocate that:

Pic 8: The Basel Technical Guidelines for the Environmentally Sound Management of Used Lead Acid Batteries, presented by Brian Wilson

The only way to implement a successful recycling program for lead acid batteries is to install an appropriate and efficient lead acid battery collection infrastructure. The most environmentally friendly procedure for collecting ULAB is through the dual system of distribution and collection when manufacturers, retailers, wholesalers, service stations and other retailing outlets provide new batteries to users and retain the used ones to be sent to licensed recycling plants. Such a scheme is sustainable because it is based on the economic value of the lead content of the ULAB.

Some control measures must be carried out at the collection points in order to minimize the risk of accidents that may cause personal injury or environmental contamination.

Batteries should not be drained at collection points – The drainage of battery electrolyte poses threats to human health and the environment because:

- It contains high lead levels as dissolved ions and suspended particles.
- It is highly acidic and may cause burns to the skin if accidentally spilled.
- The high acidity of the battery electrolyte is detrimental to plant growth.

ULAB should be stored in a secure compound – to minimize the risk of accidental spillage, to allow any batteries found to be damaged or leaking to be contained and to provide a safe workplace.

3.2.1 Collecting ULAB

Whilst the most efficient method of collecting ULAB is through the battery retailer there are those in every city, town and local community that scavenge for discarded materials that can be reused or recycled. They will scour waste dumps, strip abandoned vehicles and wrecks and collect LAB that have been used for standby power in domestic houses.

These scavengers are very efficient at finding and collecting ULAB. Moreover, they are popular in the rural areas because they will collect any ULAB from a person's home and pay them to take it away.

Their means of collection is usually with a wooden hand cart or a small trailer attached to a bicycle. Given the right safety precautions, such as wearing gloves to handle the ULAB there is nothing wrong with that.

What's important, is that the caps are secure and that the scavengers do not pour the battery electrolyte into a stream, a ditch or the local sanitation system to lighten their load. Otherwise, the hand carts and the bicycle trailers are a good means of transporting small numbers of ULAB to a central collection point.

However, for local collection, where the ULAB are picked up by truck, a cage provides a safe and convenient way of handling the ULAB.

a) Local Collection Points

It was evident from the studies that local ULAB collection facilities were not necessarily easy to manage. Nevertheless, it is difficult to police or monitor such activities at a local level and in similar circumstances; an idea has been developed in the Philippines to resolve this problem. The solution adopted in the Philippines was the introduction of wire mesh cages on wheels. The cages are made of stainless or heavy gauge steel with a open mesh floor and wheels running on nylon bearings. The cages are chained to the outside of the shop or garage and the ULAB are placed inside the cage, which also has a lockable lid to prevent anyone removing a ULAB.

Use of a cage eliminates the risk of the build up of explosive gases and keeps the ULAB of the ground, enabling any spillage to be seen and the appropriate action to remove the contamination taken.

The cages can also be used to send the ULAB to the local collection centre, provided they are secured to the inside of the vehicle used for transport. Such use of the cages also minimizes the need to handle the ULAB, thereby reducing the risk of accidents and personal injury.

In Manila these cages can be seen positioned adjacent to garages, repair shops and even in local communities.

b) Collecting ULAB

Companies and municipalities should consider either extending or establishing collection networks to raise ensure that the ULAB are only sent to licensed recycling plants. In this context, a public awareness program should be considered in order to publicize any new facilities and maximise patronage.

Specialized vehicles make collection of ULAB more efficient, safer and less likely to cause damage to the battery casing.

It is also important to train the drivers of the ULAB collection vehicles in emergency procedures in the event of an accident where there is spillage of battery electrolyte.

3.2.2 ULAB Storage

The base of the storage area must be acid resistant concrete or some other suitable flooring. If the store is under cover then an exhaust ventilation system must be installed, or simply a fast air renovation scheme, in order to avoid hazardous gas accumulation ventilation.

The storage area must have a clean water supply to clean the floors and drainage channels that run into a collection sump.

ULAB must be stored in a secure compound with restricted access and away from children and animals.

Safety procedures must be observed and employees should be wearing goggles, neoprene gloves, neoprene boots and respirators should be available if necessary.

First aid kits should be available and it is essential to install an emergency shower for use when acid is accidentally sprayed onto the skin or in the eyes.

Every single ULAB should be inspected for leaks, cracks in the battery casing and missing vent caps. Leaking batteries, i.e. those spilling electrolyte, must be stored inside acid-resistant containers. Electronic testing is advised to determine whether the battery could be recharged and reused. This practice is a legitimate and worthwhile activity because firstly it ensures that any batteries still charged are identified and thereby reduces the risk of sparking during transit; and secondly it returns some batteries to the market without the need for recycling while earning the collector additional income.

Finally the ULAB should be packaged in preparation for transport or shipping to the smelter.

3.2.3 Packaging

Prior to packing, it is important to ensure that all the ULAB have the vent caps shut to avoid spillage during shipping. If possible, replace a missing vent cap or seal the inspection hole. Obtain a selection of caps from your nearest smelter or supplier and always have them readily available. From a practical point of view damaged batteries can be transported with intact batteries if they are properly contained in sealed plastic containers or drums.

ULAB should be stacked onto wooden pallets no more than four high to minimize the risk that the stack will become unstable. A sheet of corrugated heavy duty cardboard is placed between each layer of batteries to reduce movement, absorb any electrolyte that might spill and prevent the terminal posts from the batteries puncturing the plastic case of the battery stored above. A sheet of corrugated heavy duty cardboard is also placed on top of the final layer of ULAB so that the palletised ULAB can be stored on top of each other.

Finally, the whole stack is shrink wrapped in plastic as tight as possible to minimize any movement during transit. When storing palletised ULAB prior to transportation or shipment the layers of pallets should not be stacked more than two high.

3.2.4 Transportation

ULAB must be categorized as HW when making arrangements to transport them to a recycler. The main environmental and safety risk is associated with the battery electrolyte that may leak from ULAB in transit.

Packaging the ULAB in a manner consistent with the Guidelines renders them easy to move mechanically while reducing the risk of any movement during transit thereby avoiding damaging the battery cases. As a further precaution, the guidelines recommend that the UALB are transported in a sealed shock resistant container that will not leak any electrolyte in the event of unforeseen leakage.

The vehicle used to transport the ULAB, whether it is a ship a truck or a van, must be correctly identified, following international conventions and local legislation using the appropriate symbols and colors to identify the fact that corrosive and HW is being transported.

Due regard must be given to safety of those transporting the ULAB and anyone else who may have to assist in the event of an accident. Each vehicle should have equipment necessary to combat any simple spillage or leakage problems and there should be personal protective equipment available to wear. The appropriate authorities and emergency services should be notified of the transport route and wherever possible a route should be chosen that minimizes the risk of possible accidents and avoids populated areas.

It must not be forgotten that it is important to train personnel that have to transport HW in emergency procedures, including fire, spillage and skin burns. It is also essential they know how to contact local and national emergency response teams.

Finally, if the ULAB are being transported out of the country then it will be necessary to comply with the Convention's regulations for the transboundary movement of HW.

3.3 Introduction to the Project; Chrin Sokha, Cambodian Ministry of the Environment
Introduction

The Project on "*The Environmentally Sound Management of Used Lead Acid Batteries in Cambodia"* is a prioritized project of the SBC focusing on toxic and HW or substances and the negative affects to human health and the environment.

- The SBC has initiated projects to prepare inventories of ULAB in the Caribbean, Central America, Venezuela and Colombia.
- Cambodia is the first country in Southeast Asia to receive the support for a project for such a ULAB survey to compile an inventory from the SBC.
- The workshop is a major outcome of the first six months of the project that has been primarily concerned with the compilation of the inventory.

3.3.1 ULAB Management Situation in Cambodia

There is no formal information or data that specifically addresses the correct procedures for ULAB collection, transportation, recycling and related environmental and health impacts resulted from:

- Battery recharging and reconditioning;
- The ULAB storage; and
- ULAB recycling and residue disposal.

National data on the consumption of lead acid batteries and ULAB generation is not readily available. Certainly, ULAB are collected by scavengers in local communities for either recycling locally or transport to adjacent countries, as the market demands.

Currently, there is no specific government institution paying much attention to the management and recycling of ULAB and its residues, because ULAB are not disposed of at dumpsites, but are collected by scavengers for recycling and their awareness of health and environmental impacts is limited.

According to the follow legal instruments, the MoE has an important role to play in the management and recycling of ULAB in order to comply with the environmental legal tools as follows:

Pic. 9: The Project for the Environmentally Sound Management of Used Lead Acid Batteries in Cambodia; Presented by Mr. Chrin Sokha

- Law on Environmental Protection and Natural Resources Management;
- Sub-Decree on Solid Waste Management;
- Sub-Decree on Water Pollution Control; and
- Sub-Decree on Air Pollution Control and Noise Disturbance.

The MoE has resolved a few cases where communities have complained about ULAB recycling and some illegal activities have been terminated and some shut down themselves. However, no survey or analysis of environmental and human health impacts resulting from the following activities has been undertaken:

- Lead acid battery recharging, servicing and/or reconditioning;
- ULAB storage;
- ULAB recycling and residue disposal

3.3.2 Project Background

Cambodia signed the BC on 02 March 2001. In 2002, the MoE made a project proposal to the SBC, namely, "The Environmentally Sound Management of Used Lead Acid Batteries in Cambodia" and received the approval from the SBC in 2003. The project was started early in December 2003, and is expected to finish in late August 2004 as scheduled under the close collaboration and technical assistance from Mr. Brian Wilson, an expert of ILMC. Noticeably, the project is a part of the Basel Convention's overall strategy to cover the transboundary movement of HW.

Since the start of the project and up to today, there has been about six months of project implementation, and the Task Team (TT) has completed some of the major tasks required in the work plan.

3.3.3 Project Objectives

As stipulated in the Memorandum of Understanding (MoU) agreed between the MoE and the SBC, the main objectives of the project include:

- The Identification of the consumptions flows of lead acid batteries, ULAB management and recycling, and any subsequent harmful effects on the environment and human health.

- The Identification of data and information gaps and procedures to improve the methodology towards the management and recycling of ULAB and legal tools or instruments that will support ESM.

- The prepare of an action plan for managing ULAB recycling based on ESM that builds on support and participate from interested government agencies and the private.

- Increasing the knowledge and environmentally sound methods of ULAB management to the staff of concerned ministries/institutions and the private sector including recycling, domestic and transboundary ULAB transportation.

- Securing for strong support from the RGC, those concerned ministries and full public participation.

3.3.5 Expected Outputs

Based on the achievements of the above project objectives, the expected outputs would be:

- Decision makers, the staff of concerned ministries, line agencies and the public will be more aware of the usefulness of environmentally sound recycling of ULAB and that is another key issue in applying the Royal Government Policy (RGP) for poverty alleviation, especially as

this project will identify and negate the adverse effects resulting from unsound management and recycling of ULAB.

- The outcomes of the survey as well as the comments and suggestions from stakeholders will be considered in the preparation of the national action plan for managing and recycling ULAB based on environmentally sound practices.

- To secure the full support from the RGC, those concerned institutions and public participation, including NGOs.

3.3.6 Project Implementation Plan

Task 1: According to the MoU signed by the MoE and the SBC, the main tasks to be fulfilled by the TT in cooperation with concerned ministries and line agencies are as follows:

- To conduct a ***Desktop Study*** to collect and analyze data and related information in order to identify the data and information gaps for the
    - Importation and distribution of batteries and leaded products by retailers and/or according to consumer demands.
    - Practical experiences of collecting, storing, transporting and recycling of ULAB throughout the country.
    - Environmental legal instruments and their current implementation within the public and private sectors.
    - The potential occupational health and environmental impacts caused by lead acid battery recharging/servicing/reconditioning and recycling of ULAB and any residue disposal.

- To conduct ***Field visits*** to survey ULAB at designated cities such as Phnom Penh and Sihanoukville and in the provinces of Battambang and Svay Rieng. These four survey areas were selected on the basic concept of comparing the ULAB situation in areas of high living standards in the cities and low living standards in the rural areas of the country. The designated sources for the survey included (i) battery retailers and related lead acid occupations; (ii) battery recharging/servicing/reconditioning shops; (iii) waste collection yards; (iv) ULAB recycling handicraft/places; and (v) areas/places that used LAB to stroe solar energy, for example, telecommunications, schools, pagodas, public parks and so on.

Task 2: Sending a temporary report on the general overview of ULAB management and recycling in Cambodia and the adverse environmental/human health effects to the SBC as requested. Remarkably, the technical report of Desk study and Field visit has been finished with the assistance of Mr. Brian Wilson, the SBC sponsored expert from the ILMC. Of course, this report will only be sent to the SBC after including suitable comments and suggestions from today's workshop.

Task 3: Identifying the necessary means for improving the management and recycling of ULAB, especially, the elements of a draft national action plan for the ESM of ULAB.

The workshop today emphasizes the actual overview of the present management and recycling of ULAB in Cambodia and it also debates future requirements in order to carry out the Government Policy towards poverty alleviation.

Task 4: Preparing a draft national action plan for recycling and/or reuse of ULAB based on the real Cambodian circumstances and the Basel Convention Guidelines (BCG).

Task 5: Debating with concerned ministries and line agencies on a draft national action plan that is applicable to Cambodia. After receiving any helpful suggestions from and the support of concerned ministries and line agencies, this national action plan will be submitted submit to the Council of Ministers for approval.

Task 6: Building the capacity of staff from concerned ministries and line institutions on the procedures for collection, storage, transportation and recycling/reuse of ULAB.

Task 7: Preparing the final report to the SBC in compliance with the stipulations contained in the MoU.

3.3.7 Roles and Functions of Stakeholders in the Project Implementation

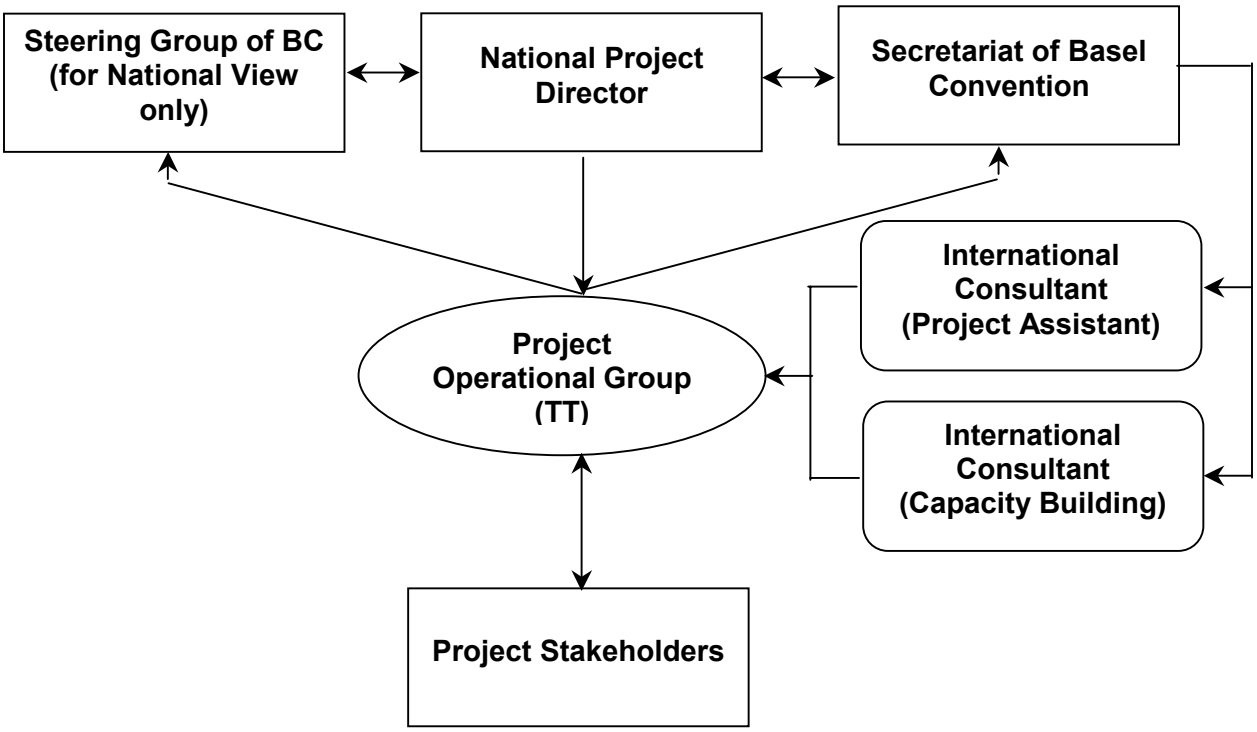
The roles and functions of concerned ministries and line institutions in carrying out the project, namely, "The Environmentally Sound Management of Used Lead Acid Batteries in Cambodia" include as follows:

- Because the project's scope includes the management of solid waste and hazardous substances and this falls under the mandate of the MoE, so the project is based in the MoE and the project Task Team was picked from the MoE:
  - Project Team Leader– Mr. Chrin Sokha, Deputy Director
  - Project Researcher– Mr. Ken Choviran, Office Chief
  - Field Engineer– Mr. Sreng Sophal, Vice Office Chief

- Concerned ministries and line institutions have responsibilities in the project including:
  - To attend the meetings or workshop in order to find out about appropriate countermeasures at national and international levels based on national and international legal instruments.
  - To provide information and data relevant to ULAB and sources of ULAB generation.
  - To facilitate and cooperate with the TT who conducted the ULAB survey and estimate the various harmful effects resulted from ULAB recycling and disposal at designated sources.
  - To review and provide comments or suggestions on a draft national action plan for managing and recycling ULAB, including provisions to provide more support to the draft plan.

- As stipulated in the MoU, the SBC and the International Consultants will:
  - Review a draft national action plan prepared by the TT, including assisting the TT in preparing questionnaires and dealing with the ULAB survey results.
  - To review technical reports to ensure compliance with BAT and best practices.
  - To assist in preparing, reviewing a draft national action plan.
  - To provide capacity building and development to the Government staff responsible for ULAB recovery and reuse.

3.3.8 Project Institutional Structure



***Pic. 10*: Structure of Project Implementation**

3.3.9 Conclusion

- The study on ULAB and the potentially harmful effects is the first task assigned to Cambodia after signing the BC. In this regard, to accomplish the implementation of the BCG as well as mitigating and eliminating the negative impacts, it is vital that there is a program of capacity building for responsible staff/persons and concerned ministries, including a special program to increase of public awareness and to gain their participation.

- After the ULAB inventory, Cambodia will have gained enough experience to enable the MoE to conduct other toxic chemical, hazardous substances/wastes inventories and action plans for Cambodia.

- The outcomes of project will demonstrate to the international community that Cambodia takes its responsibilities under this International Convention seriously.

- Significantly, the cooperation among responsible institutions and concerned ministries and line agencies is a major key to accomplish the preparation and implementation of the anticipated national action plan.

Accomplishing this concept means we can intervene and phase out all environmental and health concerns associated with ULAB and subsequently any other potentially HW.

3.3.10 Workshop Objectives

The objectives of the workshop today are focused on the following major factors:

- Showing the outcomes of the site surveys and assessments to determine:
  - The data and information gaps
  - Any inadequacies in current legal tools and their use, ULAB management procedures, private sector and government agencies awareness.

- Identifying the flow of leaded substances such as lead acid batteries and ULAB.

- Present management of ULAB and this will include the collection, storage, packaging, transportation, recycling and residue disposal.

- Assessment of the harmful impacts to the environment and human health.

- Preparing a draft of action plan for the ESM and recycling ULAB and include the plan in the national environmental management program and other developmental projects in a sustainable manner.

- Identifying the requirements for capacity building and promoting the awareness of the ESM of ULAB for concerned government agencies and the private sector.

- Supporting the national action plan for sustainable management and recycling ULAB based on best environmental practices and procedures.

3.3.11 Expected Outputs

Expected outputs of the workshop include the following:

- Participants will actively discuss and provide comments and suggestions on the designated issues discussed in the presentation sessions by the Department of Environment (DoE) Team Members.

- Delegate's suggestions and recommendations will be used in the formulation of a draft National Action Plan (NAP) for the management and recycling of ULAB including any necessary or required changes to existing legal tools and instruments.

- To increase the awareness of the potentially harmful impacts of lead acid batteries and ULAB through the life cycle from the point of sale, recharging, reconditioning or recycling and the final disposal of residues into the environment.

- To increase public and private participation in the control and ESM of ULAB, especially the decision makers in industry and government.

- To identify the requirements for the proper use or implementation of existing legal tools, instruments and related national and international guidelines.

- Determination of the National capacity for:
  - Battery recharging and servicing.
  - The methodology of ULAB collection, storage and transportation whether domestic or transboundary and to find mechanisms that ensure compliance with national and international legal requirements.
  - Recycling and the safe disposal of any residues resulted from recycling.

3.3.12 Conclusion

Based on the workshop outcomes the following could be concluded:

- The preparation of an effective action plan for ULAB management and recycling which is suitable and applicable to the real situation of Cambodia.

- Achieving commitment and support from decision makers as well as line agencies and those people concerned with the successful implementation of the national action plan.

- That with the implementation of a suitable Action Plan the public, including the private sector will have a greater awareness of the environmental and health impacts of ULAB and actively participate in the execution of the national action plan.

3.4 Current Situation for New and Used Lead Acid Batteries; Industry, Domestic and IT; Ken Choviran, Cambodian Ministry of the Environment

3.4.1 Battery –Related National Supply and Demand

Pic. 11: Current Situation for New and Used Lead Acid Batteries) in Cambodia, presented by Mr. Ken Choviran

The number of ULAB generated annually for recycling and the numbers imported and exported in Cambodia were estimated through a desktop study that collected data from these sources:

- MoE;
- Department of Customs, Ministry of Economics and Finance; (MoEF)
- Department of Camkontrol, Ministry of Commerce (MoC);
- Ministry of Public Works and Transport (MPWT)

The quantities of LABs generated and recycled annually were calculated from the following data:

- Motor vehicles licensed annually;
- New and foreign used vehicles licensed annually;
- Average lifetime of automobile batteries – locally based data; and
- Year when battery was last changed.

3.4.2 Results of the Desktop Study:

The data obtained from the MP WT is shown in the Table 1:

Table 1: Number of Registration Vehicles in the Ministry of Public Works and Transport

Year	Vehicle	LAB
1999	30,172	15,118
2000	34,024	15,466
2001	51,100	18,404
2002	26,821	14,286
Total	**142117**	**63274**

3.4.3 Estimate of Number of ULAB Recycled in Cambodia Annually

Average lifetime of automobile batteries by user is 1 year for cars and last year of change of battery by vehicle. Approximately 50% of registered vehicles replace the batteries every year.

Table 2: Estimated Total Batteries to be Recycled per Annum

Year	Battery	Lead
1999	7,559	44,333
2000	7,733	45,354
2001	9,202	53,969
2002	7,143	41,894

3.4.4 Imports and exports of Lead, Acid and Batteries into Cambodia

The import of lead, acid and batteries is the responsibility of the Department of Customs, MoEF in cooperation with the Kamcontrol Department, MoC. Generally, the lead substances/materials, acid and batteries are imported from Vietnam, Thailand, Japan, South Korea, Malaysia, etc. Until now, there was no data available in the country for the export of lead, acid and batteries, only import data which could be obtained from the Department of Customs. The lead, acid and batteries are only imported for domestic use and this has dramatically increased as shown in table 3 below:

Table 3- Import of Lead, Acid and Batteries

Year	Lead (T)	Acid (L)	Lead-Acid Battery (Kg)
2000	10,930	139,276	4,140,885
2001	1,100	1,999,770	31,083,792
2002	2,000	1,808,067	1,896,193
2003	10,109	965,280	3,165,354

Source: Department of Customs, Ministry of Economy and Finance, 2004

3.4.5 Legal and Regulation Framework

Currently, the environmental laws and related sub-decrees already entered into force for the protection of human health and the environment, such as the Sub-Decree on Solid Waste Management; Sub-Decree on Water Pollution Control. However, these are not specific to ULAB management, and they do not control the transboundary movement of ULAB. More importantly, the BCG on the collection, storage, transportation, recycling and disposal of ULAB has not been introduced in any of the cities and provinces in the country, despite that fact that the Royal Government has accepted the Guidelines as a Party to the Convention. The matter of responsibility for the health and safety of the workers who are exposed to ULAB has to be resolved. It is unclear where the responsibility lies and this is further compounded in the absence of occupational health monitoring and any specific laws or regulations on the safety of handling ULAB.

3.4.6 Battery sales outlets

Shops are selling new lead acid batteries for trucks, cars, motor cycles and domestic use (burglar alarms, back up systems, and so on). Each shop had a stock of 100 to 400 new and boxed lead acid batteries imported from Vietnam, Japan, Korea and Thailand. Some of the battery components are made locally by people in Cambodia. All the batteries on sale were good quality and branded names. The majority of the batteries appeared to be made with the latest maintenance free (MF) technology using lead/calcium alloys grids. Sales varied, but on average, the shops would expect to sell from 10 to 20 batteries per day in the downtown areas and 1- 5 in the remote areas of the provinces. The shops also service batteries, that is, the staff will test a battery to determine whether it needs to be replaced, topped up with deionized water or recharged. Many batteries in use still require the caps to be removed when being charged to permit the gases given off to escape to atmosphere. Usually, the shops had sufficient recharging units for about 20 batteries.

3.4.7 Recharging and Reconditioning of ULAB

The shops were engaged in servicing and reconditioning batteries and collecting ULAB for resale to the waste recyclers. At present, ULAB collection is not a good business because the battery users are selling ULAB directly to the scavengers. There is only a small minority of shops reconditioning the ULAB, because the users prefer to sell the ULAB to a scavenger than pay for reconditioning. The battery charging aspect of the business has been declining in the downtown areas due to the increasing number of homes with a direct and reliable supply of electricity. On other hand, it had been increasing dramatically in the remote areas due to the increasing number of TVs, domestic lighting and other demands such as catching fish by electrocution and rat catching in the rice fields. The diesel generator is used to produce a DC current to recharge the batteries, especially in the remote areas, and this takes about 5 to 8 hours depending on number of batteries to recharge, the types and sizes. Normally battery acid consumption, to top up the electrolyte, is about 10 to 60 liters per month. Once recharged, a battery should normally last for 3 days, sometimes 5 days depending on the recharging technique, the demand on the battery, and the battery's age and quality.

3.4.8 ULAB Collection and Storage Sites

Most of the collection sites were constructed on a plot with the soil as the floor or base, except for just a few sites that were constructed on paved areas. ULAB are collected by scavengers from small ULAB collection sites in various districts of the provinces and from local users. Usually, the scrap yard owner has his own collection network for ULAB all over the province and in many cases the neighboring province. The ULAB are transported by hand cart, bicycle, motorcycle and small truck to a recyclable waste collecting site. All ULAB are sold to merchants in Phnom Penh Municipality and then resold to dealers abroad for recycling. Before selling the ULAB they are stored in a secure room or compound together with other piles of recyclable waste. Usually, scavengers drain the acid from the battery before selling it to the owner of the collection site because battery acid is not purchased. Most of the scavengers drain the electrolyte from the battery at the point of purchase to lighten the transport load.

3.4.9 Recycling Site

ULAB recycling enterprise located in Battambang Province and built on a plot of land. The recycling enterprise still has two separate lead smelting sites. The first one is a plot (60 x 100) surrounded by rice fields and about 8 km from the enterprise and 2 km from populated areas. The ULAB breaking operation is manual.

The lead bearing waste was placed on the ground near the smelting furnace. The battery cases are sent to the milling machine and the remainder, such as the plate separators, are put into a pile for incineration.

The lead bearing waste is melted in the open and without any form of ventilation or extraction using a small crude melting furnace made from a length of metal tube about 1 m long and 0.4 m in diameter. Charcoal is added to the leaded scrap as it is charged to the melting furnace in order to encourage reduction of some of the battery paste (lead oxide) to produce metallic lead (lead bullion). After the first melting operation had been shut down temporarily, due to the complaints made by people living and working close to the operation, the melting furnace was moved to another site about 2 km from the first one and this is located at a small empty elevated plot of land surrounded by a vast rice field. The lead output and the operating procedures were the same, but the battery breaking process was still carried out at the first smelting site. Right now, the second melting site would seem to be secure for the owner because nobody has complained yet.

3.4.10 Solar energy Remote Area Power Supply units (RAPS)

Only a few RAPS units have been installed by local people. Mostly they have only been installed with government assistance or through international organizations or NGO aid programs at public schools, parks, municipal buildings and bridges. The RAPS consists of solar panels that convert sunlight into electrical power to charge specially designed deep discharge lead acid batteries. Generally, these batteries are used to provide AC electrical power for lighting, TVs, computers and IT equipment in place of the mains electrical supply when it is unavailable. Most of the deep discharge lead acid batteries are good branded names from Germany and Japan. To date, about 10,000 such batteries have been imported into Cambodia by local private companies. These batteries are 50A, 70A,100A, 120A and 200A rated and normally have an average life from 10 to 15 years, but in Cambodia its useful life is only 7 years and this may be associated with the hot climate.

3.4.11 Telecom Company

The major telecom companies are using lead acid batteries and converters to produce the AC electrical power for phone operations during power outages. Most of the batteries are branded names from Germany, Japan and Malaysia.

3.5 Legislation and Related Awareness/Knowledge Needs; Sreng Sophal, Cambodian Ministry of the Environment

3.5.1 Introduction

- Nowadays, the RGC pays special attention to stabilizing and boosting the state environment. Key to the policy are:Public Administration, Military Demobilization of Armed Forces;
- Economic, Public Finance, Legal, Judicial Reform;
- Land Policy Implementation;
- Environmental Protection; and
- Sustainable Natural Resource Management.

All aimed at alleviating the people's poverty.

Pic. 12: Legislation and related awareness and knowledge needs, presented by Mr. Sreng Sophal, Field Engineering Staff

3.5.2 Environmental Law

In order to alleviate poverty the RGC has adopted the Environmental Law to protect and restore the environment as well as prevent threats to human health.

- This Law was enacted on Dec 24, 1996 and has 11 chapters and 27 articles.
- Each chapter is show below:
  - Chapter 1: General provisions
  - Chapter 2: National and Regional Environmental Plans
  - Chapter 3: Environmental Impact Assessment
  - Chapter 4: Natural Resource Management
  - Chapter 5: Environmental Protection
  - Chapter 6: Monitoring, Recording Keeping and Inspection
  - Chapter 7: Public Participation and Access to Information
  - Chapter 8: Environment Endowment Fund
  - Chapter 9: Penalties
  - Chapter 10: Interim Provisions
  - Chapter 11: Final Provisions

3.5.2.1 General Provisions

- To protect and promote Environmental quality and public health through prevention, reduction, and controlling point and non specific sources of pollution.
- To ensure the rational and sustainable conservation, development, management and use of natural resources.
- To encourage and enable public participation in environment protection and natural resource management.

- To suppress any acts that cause harm to the environment.

3.5.2.2 Environmental Protection

MoE shall collaborate with concerned ministries to develop an inventory indicating the following:

- The sources, types, and quantities of all pollutants and wastes being imported, generated, transported, recycled, treated, stored, disposed of, or released into the atmosphere, water, or on land.
- The sources, types, and extent of any noise and vibration disturbances.
- The prevention and control of atmospheric, water and land pollution, noise and vibration disturbances and provisions on waste, toxic substances, and hazardous substances shall be determined by sub-decree following a proposal from the Ministry of the Environment.

3.5.2.3 Public Participation and access to information

- MoE shall provide, following a request from the public, information on its activities and will encourage public participation in environmental protection and natural resource management.
- The procedures for public participation and access to information shall be determined by Sub-Decree following a proposal of the MoE.
- Information related to environmental protection or natural resource management shall be mutually disseminated between the MoE and other ministries.

3.5.3 Sub-Decree on Solid Waste Management

There are 6 chapters and 32 articles.

This Sub-Decree aims to regulate solid waste management in a technical, but safe way in order to ensure the protection of human health and the conservation of the existing bio-diversity.

It applies to all activities related to disposal, storage, collection, transport, recycling and the dumping of garbage and hazardous waste.

Technical terms used in this sub-decree have the following meanings:

- Solid waste refers to hard objects, hard substances, products or refuse which is regarded as useless, to be disposed of, or intended to be disposed of, or required to be disposed of.
  Household waste is the part of solid waste which does not contain toxins or hazardous substances and is discarded from peoples' dwellings, public buildings, factories, markets, hotels, business buildings, restaurants, transport facilities, recreation sites and so on.
- HW refers to substances that are radioactive, explosive, toxic, flammable, pathogenic, irritating, corrosive, oxidizing, or any other chemical substances which may cause danger to human health, animal welfare or damage to plants, public property and the environment. The HW may be generated from houses, industries, agricultural activities, businesses and service activities, mining and so on.
- The types of HW is listed in the Annex to the sub-decree:

- Soot and dust waste from incineration facilities treating exhaust gases.
- Household management: establish guidelines on disposal, collection, transport, storage, recycling, waste minimization, and dumping.
- HW management: improving disposal, collection, transport and storage from factories and hospitals and to separate it from domestic waste.
- Monitoring and inspection of HW management: identify the procedure of monitoring, packing, transport, storage, recycle, incineration, treatment, and disposal.
- Penalty for violations of the regulations.
- Types of HW:
  - Fibrous and clothing wastes from the textile and garment industry;
  - Paper waste from paper-mill industry;
  - Sludge wastes from factory water treatment plants and product manufacturing processes;
  - Combustion residues from coal-fired power plants;
  - Plastics wastes from production or use of plasticizers;
  - PCB waste from use of PCB contained in discarded air conditioners, TVs and microwaves;
  - Rubber waste from production or use of resins and latex;
  - Oil refinery waste, lubrication oils, solvents;
  - Acid waste;
  - Alkali waste;
  - 12- Metal wastes and their compounds,

Zinc (Zn)	Selenium (Se)	Tin (Sn)
Vanadium (V)	Copper (Cu)	Arsenic (As)
Barium (Ba)	Cobalt (Co)	Nickel (Ni)
Antimony (Sb)	Beryllium (Be)	Tellurium(Te)
Lead (Pb)	Titanium (Ti)	Uranium (U)
Silver (Ag)		

Key - ……. – metals used in LAB

- Soot and dust waste from incineration facilities treating exhaust gases;
- Wastes from used or discarded electrical lamps;
- Wastes from production or use of batteries;
- Wastes from production and use of paints, lacquers and pigments;
- Wastes from production and use of inks and dyes;
- Explosive wastes;
- Infectious diseases wastes;
- Agriculture drugs wastes;
- Ash wastes from incinerators;
- Wastes from expired products;
- Wastes from production and use of film;
- Waste from treatment of polluted soils;
- Waste from production of drugs and medicines, and expired drugs;
- Inorganic fluorine wastes;
- Cyanide wastes;
- Asbestos Wastes;
- Phenols wastes;
- Ethers wastes;
- Wastes from production and use of solvents;
- Wastes from production that generates dioxin and furan;
- Radioactive wastes;

3.5.4 MoE declarations for Waste Management.

These declarations were established in order to promote Sub-Decrees and authorize the local authorities to implement waste collection in the provinces and cities such as:

- To carry out the Sub-Decrees on Water Pollution Control, Sub-Decree on Solid Waste Management for urban and provincial Environmental Departments.
- The joint declaration between the MoE and MoI on the collection of waste from towns in the provinces.

3.5.5 Constraints & Conclusions

Currently, the KoC has environmental laws and related regulations, but these are not strongly focused on specific issues and they are promoted or understood in the rural areas in the country, as the survey team of ULAB project found out during the many interviews and assessments undertaken during the field studies.

3.5.5.1 Constraints

- People do not understand the laws or regulations as yet.
- No institutions are available to disseminate the laws.
- The cooperation between the concerned ministries and other agencies is weak.
- The laws and regulations have not been communicated to the rural areas.
- The Laws and regulations are not focused on ULAB and do not mention the obligations under the BC.

3.5.5.2 Conclusions

In order for the laws and other related regulations to be effective and followed by people throughout the country the following action must take place:

- The BCG on ULAB should be translated and distributed.
- MoE should promote the Environmental Laws and Regulations.
- MoE should disseminate the Laws and Regulations in cooperation with other concerned ministries.
- The laws and sub-decrees should be amended to include the shortcomings identified in the study.
- The MoE should establish the guidelines on ULAB and explain the adverse effects on human health and environment if ULAB are not managed properly.

3.6 The International Situation for ULAB – Regional Overview; Brian Wilson, ILMC

Rather than reinvent the wheel in our quest for the ESM of ULAB in Cambodia, it might be helpful if we examine and consider what other countries in the region have done in their quest for the sound recovery of ULAB. It will also provide an insight into the different problems encountered by some of the other countries and the various policies and practices chosen to resolve those issues.

In the course of our South East Asian tour we will look at ULAB management in Singapore, the Philippines, Malaysia, Thailand, China and India.

3.6.1 Singapore

Singapore is a small country with a limited land mass. Housing, industry, water catchments and recreation areas place great demands on the land available, so it is very important that HW are safely managed to protect the population and conserve the environment.

The key elements in Singapore's strategy to control HW and ensure their safe treatment and disposal are as follows:

- Avoid the generation of intractable wastes wherever possible.
- Encourage waste minimization.
- Encourage waste reuse, recovery and recycling.
- Regulate, monitor and audit the collection, treatment and disposal of wastes.
- Provide public educational and training programs about waste control.

3.6.1.1 The Environmental Public Health Regulations (TIWR)

The collection, recycling, treatment and disposal of toxic industrial wastes including ULAB are controlled under the Environmental Public Health Act (EPHA) and the Environmental Public Health (Toxic Industrial Wastes) Regulations (TIWR).Under these regulations the functions and responsibilities of key persons involved in the handling of ULAB are clearly defined in the TIWR. The key people are the:

- Generator of the ULAB, that is, the public for the most part. Anyone replacing a LAB must return the ULAB to the retailer.
- Collector of ULAB and that can be the retailer – It is necessary to obtain a licence from the DEPC to collect and store ULAB in approved premises.
- Carrier, that is, the person who arranges the transport of the ULAB. Written transport approval from DEPC is also required for the transportation of ULAB. To prevent illegal dumping and disposal of toxic industrial wastes, the movement of wastes is tracked by means of the consignment note system.
- Driver of the vehicle with the ULAB

3.6.1.2 Basel Convention – Transboundary Movement

Singapore acceded to the BC in January 1996 and in March 1998 enacted 'The Hazardous Waste (Control of Export, Import and Transit) Act and its "Regulations" to strengthen the control on export, import and transit of HW in accordance with the principles and provisions of the BC. Under the Hazardous Waste Act Regulations the export, import or transitof hazardous wastes, such as ULAB requires a permit from PCD. The PCD follows the Prior Informed Consent (PIC) procedure of the BC in granting any permit for the export, import or transit of ULAB and they are only exported to countries with ESM.

3.6.1.3 Monitoring and Enforcement

Control systems require enforcement to ensure that regulations are not violated and without constant monitoring by DEPC Inspectors it is possible that companies that originally comply with controls may become complacent and pay less attention to their operations and procedures.

Monthly checks are conducted on the premises of ULAB collectors and the records are audited to ensure requirements on collection, storage, transport and export of ULAB are complied with. Singapore does not have a secondary lead smelter and so the practices and procedures followed in the principality for the ESM of ULAB could be a model for Cambodia.

3.6.2 The Republic of the Philippines

It is very easy when we are pursuing policies and programs to improve environmental performance and reduce population exposure to pollutants to overlook the social impacts of our decisions. While none of us, and least of all the International Lead Management Center (ILMC), would wish to defer projects and technologies designed to raise the standards of environmental performance, it is important to take into account the social needs, priorities and aspirations of those people directly affected by Government policies, national legislation, new technologies and changes in trading patterns.

Such a situation, typical of many in the developing world, can be found in the Republic of the Philippines. The Philippines is an archipelago of over 7,000 islands and a population of over 78 million people. The Government actively promotes legislation to raise environmental standards, supports the BC and in conjunction with the United Nations Conference on Trade and Development (UNCTAD), the United Nations Development Program (UNDP) and the ILMC is applying strategies to promote ULAB recycling in an environmentally sound manner. The Philippines is a rapidly industrializing non Annex VII nation with a profitable lead acid battery recycling industry and a major automotive battery manufacturing sector exporting to over 40 countries. Demand for lead outstrips domestic supplies by some 40% and the secondary lead industry has so far filled this gap by importing used lead acid batteries.

3.6.2.1 Philippine Lead Consumption

Typically, lead consumption in the Philippines is about40,000 metric tons of refined lead. Recycling domestically sourced ULAB produces approximately 23,000 MT. 12,000 MT is produced from imported ULAB and the balance of about 5,000 MT is imported from the primary producers as refined lead.

That means that nearly 60% of the lead consumed in the Philippines is sourced within the archipelago and nearly 90% of all lead consumed is produced by the secondary lead industry from ULAB.The formal licensed sector, primarily PRI, produced nearly 23,000 MT of secondary lead and the balance of 12,000 is produced by the informal sector. These statistics mean that the informal sector accounts for 30% of the secondary lead production in the Philippines.

PRI is an environmentally sound secondary lead smelter, but the same cannot be said for the recyclers in the informal sector.

The Government's Environmental Bureau is working hard to monitor the performance of the informal sector and has closed down at least three major polluters.

The Philippines has ratified the BC and ULAB are imported into the country under license from the Government in accordance with the Regulations for the Transboundary Movement of Hazardous Waste and PIC.

PRI is the only company permitted to smelt imported ULAB.

3.6.2.2 Philippines - Social Impacts

Whilst we can calculate the tonnages produced by the informal sector, in order to determine the full economic impact of the informal sector we need to understand the social interactions. To an extent, this can be achieved by comparing the two sectors and their respective societal components.

The Formal sector is comprised of a licensed battery recycler and battery retailers that return ULAB to the regulated secondary smelters. These organizations are part of multi million dollar corporations and employ about 400 people directly and approximately another 1000 either indirectly or part time in retail and repair shops. Annual export earnings are estimated to be in the region of US$ 12M.

In contrast, the Informal sector comprises of "backyard smelters" and battery reconditioners owned and managed by small family groups, but employing an estimated 20,000 or more people. The income generated by this sector is at least US$ 5M, albeit much of it within the "black economy" thereby denying the Government valuable tax revenues. Nevertheless, informal sector incomes are usually only just sufficient to keep those dependant families above the subsistence level. The Government of the Philippines is trying to educate those employed in the "informal sector" about the hazards of ULAB recovery and persuade them to just collect the ULAB and sell them to PRI. In this way, those employed in the "informal sector" can still earn an income, but without the inherent risks to their health and damage to the environment.

3.6.2.3 Cost Benefits to PRI of ESM

Since the completion of the initial Improvement Program in 2001 and ISO Certification, PRI have recorded some remarkable benefits:

- A drop of 19% in the production of furnace residues, due to efficient reagent use.
- The costs of fuel for the furnaces has been reduced by 17%.
- Electrical power consumption has been reduced by 21% as the baghouses do not have to capture so much fume or dust emissions.

- The costs associated with environmental management, that is, water treatment, residue management and housekeeping are down by 20%.

So, if there are any Industry representatives that might be wondering how much environmental improvements add to the "bottom line" of the balance sheet, these results should provide every incentive to raise standards.

3.6.3 Malaysia

The Ministry for the Environment is responsible for the administration of the regulations that control the management of ULAB.

Essentially, there are two regulations that are the backbone of the legislation, the Scheduled Wastes Order and the Treatment and Disposal Regulations of 1998.

ULAB are listed as a hazardous waste in Annex I of the regulations and there are specific rules that are applicable for collection and recycling.
Malaysia has ratified the BC and has issued Guidelines for the export of HW materials for recycling, but ULAB are neither imported nor exported.

Metal Reclamation (Industries) Sdn. Bhd

Regulation 4(1) of the Environmental Quality (Scheduled Wastes) Regulations 1989 requires that "Scheduled wastes shall be disposed of at prescribed premises only".

The DOE has approved a license for Metal Reclamation (Industries) Sdn. Bhd (MRISB) to operate such a prescribed premise to recycle ULAB and under the same license MRISB also manage a fleet of five trucks to transport leaded wastes and ULAB to the recycling plant.

MRISB completed the construction and commissioning of a new 120,000 MT secondary lead smelter three years ago, making it the largest smelter in the ASEAN Group.

The smelter uses the latest energy efficient IsaSmelt technology. This technology produced an inert non toxic waste and lead free gypsum that is sold to the cement industry.

However, because the Malaysia hazardous waste regulations do not permit the import of ULAB, MRISB cannot meet the demands of the indigenous battery industry for lead alloy by smelting domestically sourced ULAB. MRISB are therefore, having to smelt lead concentrate from primary mined sources to meet orders. (http://www.metal-reclamation.com/)

3.6.4 Thailand

There are three Government Ministries interested in the management of ULAB. The Ministry of Natural Resources and the Environment's Department of Pollution Control is responsible for applying the appropriate legislation for the collection, storage and transport of ULAB.

The Ministry of Industry is responsible for licensing the ULAB recycling plants and monitoring their compliance with environmental laws.

Thailand has ratified the BC and in a manner similar to Malaysia does not permit the export or import of ULAB.

The Ministry of Health is responsible for assessing the health impacts of lead plants and only two years ago was responsible for closing the Klity Primary Lead Smelter after serious and persistent lead contaminated discharges and emissions that poisoned some of the local population living close to the plant.

Thailand – Secondary Lead Smelters

Thailand has both primary and secondary smelters producing about 75,000 MT of lead per annum.

There are three main secondary plants that all use Rotary Furnace Technology:

Bergsoe Metals in Saraburi, producing about 12,000 MT of lead per annum from ULAB.

Thai Metals Smelting in Rajburi. This plant was upgraded in 2001 by Boliden Contech AB. There is now one rotary furnace with an oxygen enriched fuel burner and a gas cleaning system. The new furnace is operated by a state-of-the-art control system and it replaced three old smaller furnaces. The plant and has a capacity of approximately 12,000 tons of lead bullion per annum.

Thai Non-Ferrous Metal Co. in Chachoengsao, recently invested 300 million baht to upgrade their production capacity to 47,200 MT of lead alloys.

However, in the absence of imported ULAB and the closer of the Klity Lead Mine there remains a chronic shortage of lead bullion in Thailand. As the Ministry Survey has shown, this manifests itself in ULAB smuggling across the Thai Cambodian border.

3.6.5 China

The Chinese Secondary Lead Industry is going through some dramatic changes as the Government increases its levels of surveillance and enforcement of environmental regulations.

In 1996, there were approximately 500 secondary lead plants in China, producing about 170,000 MT of finished lead and alloys. Since then, the Chinese environmental agencies have been steadily increasing the enforcement of the environmental protection regulations and closed about 200 lead recycling operations.

In September 2003 the secondary lead companies in Jieshou City and Taihe County in east China's Anhui Province were shut down due to unresolved environmental pollution problems. In past years, this area has produced half of the secondary lead in China. However, decades of neglect, poor operating practices and a lack of environmental control systems have caused severe lead contamination and population exposure.

In June of 2003, the region was listed as one of the eight worst polluted regions by the Chinese State Administration of Environmental Protection Agency. So bad is the situation that the farms adjacent to the recycling plants are no longer allowed to grow crops and the farmers are now under medical surveillance. Furthermore, in July last year, three small lead refineries south of the capital Beijing, at Baoding in Hebei province had been forced to shut permanently due to unresolved environmental problems. The trend is clear and the Chinese Government environmental agencies are intent on eliminating those secondary lead plants that fail to control lead emissions and discharges to the environment.

3.6.5.1 China – Environmental Protection Agency

In August 2002, the Chinese Ministry of Foreign Trade and Economic Cooperation, the Chinese General Administration for Customs and the State Environmental Protection Administration issued a joint statement announcing an import ban would come into force on August 15 for a selection of items listed as "Banned Imports." The List was issued in accordance with the Regulations for the Administration of Imports and Exports, the Law on the Prevention and Control of Environmental Pollution by Solid Waste and the Notice on the Importation of Waste. Imports included on the list are leaded slag, drosses and ULAB.

The ban was enforced immediately and the very next month Taiwanese coast guards seized four people in a fishing boat attempting to smuggle about 30 MT of ULAB from Taiwan to the Chinese mainland for a fee of nearly US$ 1,800. It is a certainty that the Coast Guards and Environmental Agencies were aware of the activities of the smugglers and that such an illegal trade in ULAB was not uncommon.

Taiwan in a good source of ULAB with about 50,000 MT of ULAB to be recycled annually, but the rate of collection and recovery according to one licensed recycler in Taiwan is only about 60%. The Chinese authorities are also certain that the smuggled goods were destined for an unlicensed "backyard" recycler. The actions of the Chinese Government will reduce the levels of environmental exposure, but there remains a chronic shortage of lead to meet the increasing demands of the battery manufacturers.

The Jiangsu Chunxing Group, China's largest lead scrap recycling company, has gone to extraordinary lengths to meet demand. Chunxing has established a lead recycling company in Thailand, which is primarily engaged in collecting ULAB, recovering the lead and shipping it to China.

3.6.5.2 China – Tax Disincentive

The national and local municipal Chinese government agencies support recycling and in many of the new enterprise zones provide a range of financial incentives for new companies entering the recycling business for the first time.
It is a paradox therefore to discover that the Chinese government collects Value Added Tax (VAT) at the rate of 10% from the secondary lead companies when they purchase ULAB. Initially introduced in 1993 at the rate of 17%, the Government reduced the tax on ULAB to 10% in May 2001 after lobbying from the industry. Nevertheless, this tax remains a marked disincentive to the recycling of ULAB. Furthermore, it is most likely that the tax is only paid by the licensed and environmentally sound recycling companies and ignored by the "backyard" recyclers. No other country applies VAT in this way to a hazardous waste when it is destined for recovery. This tax law therefore places the Chinese secondary lead industry at a distinct disadvantage against the primary lead producers because there is no VAT charged on raw materials such as lead concentrate.

3.6.6 India

Lead production in India has remained virtually static over the last decade, despite the fact that demand has more than doubled from 55,000 to 123,000 MT and this has led to a widening supply-demand gap.This sharp rise in demand in India is not only due to the increase in the vehicle population, which has been rising at about 7% per annum, but the widespread use of automotive batteries for domestic purposes such as lighting, 12 volt TVs, lead acid UPS units for computers and valve regulated lead acid storage batteries for solar power supplies.

India has an extensive informal sector comprising of battery reconditioners and backyard smelters that pay scant regard to any environmental and occupational health regulations. Traditionally, without the environmental overheads of the licensed sector, they have paid up to US$ 100 per MT above the international price for imported ULAB to secure feedstock, effectively freezing out the licensed secondary smelters from the ULAB market.

In 2001, the Government passed into Law the Batteries Management & Handling Rules to restrict the informal sector from access to ULAB. The new law directs retailers and garages to collect ULAB and send them to licensed smelters only. India does permit the import of ULAB and under the new law they can only be auctioned to the formal sector. A further measure to ensure that dealers send ULAB to the licensed smelters is that the industry has been set targets for ULAB recycled in the formal sector that start at a modest 50% rising to 90% over 3 to 4 years.

3.6.6.1 India – Environmental Assessment Scheme

In order to determine which smelters can receive ULAB the Government also set up a scheme for the assessment and registration of Environmentally Sound secondary lead plants.
Smelters are inspected and checked to verify compliance with the regulatory standards, the adoption of prescribed codes of practice for ESM and that there is proper provision for the safe disposal of furnace residues. If the smelter is using a ssecured land fill for disposal of the residues, then the facility is checked for the provision of a leachate collection containment and treatment system that meets the limit prescribed for heavy metals, namely cadmium, lead and nickel. Emissions are monitored to ensure that the control systems comply with the stipulated code and that stack emissions do not exceed 10 mg/Nm^3 for lead and 50 mg/Nm^3 for total particulate matter. To date nearly 40 plants have been assessed and registered as environmentally sound. As a result, today, there is a fair distribution of Units with environmentally sound reprocessing capability across the country. This has helped avoid transportation of ULAB over long distances.

3.6.6.2 India – CUTS

The Consumer Unity and Trust Society (CUTS) is a non profit making NGO founded in 1983 by a small voluntary group of concerned citizens without any funds operating out of a garage. Today CUTS has four centers in India and one in Zambia, and a staff of over 65 people. CUTS work is divided into four areas:

- Consumer protection, which includes accountability, regulatory reforms;
- Trade and development, including investment and competition policies;
- Sustainable production and consumption, including consumer protection;
- Rural consumers and women's empowerment.

CUTS has a great empathy with the India workers and consumers as one of the consequences of the Battery (Management and Handling) Rules 2000 was the need for capacity building for those people involved in the ULAB sector so CUTS was a natural choice to prepare workers for the ensuing changes and improvements in environmental performance.

CUTS-CSPAC, CUTS Center for Sustainable Consumption & Production, undertook a one year project with the support of the Ministry of Environment and Forests, to promote and facilitate environment friendly lead smelting.

Five training workshops together with one National Consultation and Expert Group Meetings were organised. A Pocket Operations Handbook in Hindi was prepared for small to medium sized businesses on the Safe and ESM of ULAB. Following the workshop series CUTS prepared a monograph entitled "Greening the Lead Acid Battery Sector: Structure, Problems and Needs" to outline options to address ULAB recover in India.

CUTS were also promoting EcoMark labels in line with many countries considering the introduction of special labels for products such as LAB that can be potentially harmful. The label shown is a composite of many ideas from the region and others, and includes:

- Iinternational recycling symbol ISO 7000-1135 or Mobeus loop.
- Iinstructions for the recycling of the battery and a point of contact.
- The words "lead-acid battery", "LEAD", "RETURN and RECYCLE".

Some have hazard symbols warning of the dangers of battery acid.

If possible, the label should also have a bar code containing information about the place of manufacture, the date of production, the battery type and its components.

3.7 The Main Issues of ULAB Management in Cambodia; Sreng Sophal, Cambodian Ministry of the Environment

3.7.1 Introduction

- LABs are used for many purposes, domestic, vehicles, etc.
- LAB helps people where there is no direct electricity supply.
- Most countries returned ULAB for recycling.
- ULAB are sold and exported to other countries for recycling.
- If not managed correctly ULAB could harm the Health of the population and damage the environment, the Basel Secretariat list ULAB as a HW.
- Properly managed LAB and ULAB can help people to reduce their levels of poverty, giving them jobs and income, otherwise, environmental impacts can and adverse environmental impacts can occur.

3.7.2 Selling, Recharging, Reconditioning shops

3.7.2.1 Overview

- Recharging shops are usually operated within the retail shops and some will also recondition ULAB.
- They practice recharging in front of their houses/flats and some on lots of land.
- Some shops are near markets in towns or in local communes in the rural areas.
- Recharging shops utilize direct power where it is available and uses generators to produce power in the rural areas where power is not available. Some shops employ workers and others are operated by the shop owners.
- They provide the services such as testing the LAB, exchanging ULAB and topping up with deionized water.
- Some shops also obtained ULAB for reconditioning. There were no fire extinguishers at the recharging shops.

3.7.2.2 Impact on Human Health

As revealed by some concerned people or workers who get involve with LAB and ULAB occupations, the project team can conclude as follows:

- Workers/people often get sick and many suffer from chronic illnesses * (Lung, liver, and breath... etc.).
- People suffer acid burns, or get scabies on the skin, especially on the palms of the hands.

3.7.2.3 Impact on Environment

- Noise pollution from the diesel generators that are often run during people's rest periods.
- The battery acid can harm the trees or plants near to the shops.
- The vapors discharged during the recharging process cause air pollution and are most unpleasant.
- Solid waste: small scraps of case material or lead from broken grids can pollute the soil.

3.7.3 Waste Collection Yards

3.7.3.1 Overview

- Most scrap collection Yards are located on the outskirts of cities, although a few are located inside towns.
- Scrap Yards mix ULAB with other scrap items in the storage areas.
- Some Yards and shops stored ULAB near bed rooms, resting places and dining rooms.

- LAB shop activities spread to the sidewalk.
- Scrap collectors often pour out the battery acid out before weighing the ULAB. The acid is poured onto the ground, into a pit or a collection sump in front of the shop.
- None of the workers observed in the survey were wearing protective equipment during their work periods.
- Some scrap yards and shops brought ULAB for smelting and others for export to foreign countries with other scrap items.
- The Scrap Yards were untidy both inside and outside the yards.
- The dust from the mixed scrap items caused to harm to the environment and the local populations.

3.7.3.2 Impact on Human health

- People can get hurt or injured from battery acid when they are in the habit of sleeping near an untidy pile of ULAB.
- People get scabies on the skin.
- Workers who handle ULAB directly without using neoprene gloves will be burned from the effects of the acid.

3.7.3.3 Impact on Environment

- The spillage or discharge of battery acid on the ground impacts on the ecology of the eco-system.
- Solid waste can be an issue at some of the shops, especially those involved with reconditioning.
- Water Pollution when they discharge the acid into the sewage pipes, rivers or streams

3.7.4 Melters

3.7.4.1 Overview

- Melting operations are usually located in rice fields.
- They are often close to ponds with fish and plants and surrounded by trees.
- They operate in the open and usually during the night time.
- Workers have no protective equipment.
- Fume emissions are under the direction of the wind.

3.7.4.2 Impact on Human Health

- Workers often get sick, because they work without protective equipment.
- People around the smelter get sick because of the bad smells and fume from the smelting of ULAB.

3.7.4.3 Impact on Environment

- Air Pollution from burning the batteries producing lead fume and dangerous hydrocarbons together with a great deal of smoke.
- Soil Pollution from small scraps of ULAB and other items left on the ground after melting and these will pollute nearby plants or trees.
- Water Pollution from small scraps of oxide paste and battery acid pollute the river and pond water that in turn affects the fish.
- Pollutes the ground water that will damage the ecology of the eco-systems in those areas.

3.7.4.4 Comparison between Cities and Provinces

a) Cities

- Most people use LAB for Vehicles.
- LAB is recharged by direct electricity.
- Recharging shops are located within battery selling shops.
- Workers are aware of the hazards of LAB and ULAB including the lead effects on people.
- Most workers wear gloves and masks during their work.

b) Provinces

- Most LAB are used for domestic purposes.
- LAB are recharged by diesel generators.
- LAB recharging shops are separate from selling shops.
- Workers are aware of the battery acid effect, but are not aware of the effects of lead on the human species.
- Most workers don't wear gloves or masks during their work.

c) Conclusion

Interviews with people in both cities and provinces indicated that:

- On the whole people are not aware of the lead risks to human health.
- Workers are not particularly careful about using protective equipment during their work.

- There are no institutions to disseminate the effects of acid or lead to the environment and to people, workers or shop owners.

- There are no regulations or relevant statutes on LAB sales or ULAB recovery.

In order to complete the targeting of ULAB management and to prevent serious effect on human health as well as the environment, the urgent measures should be implemented, that is the education of people and workers who work directly or indirectly with LAB or ULAB. In this regard, MoE should cooperate with the DoE to control, regulate and enforce the International Laws on the ULAB smelting operations in order to avoid the serious risks to the environment and public health.

4.0 DELEGATE BREAK OUT SESSIONS

4.1 Delegate Break Out Sessions

4.1.1 Review the National Legislation and International Conventions and formulate policies and statutory procedures that could be formulated to provide sound collection and recovery of ULAB in a manner consistent with the BC and the Guidelines for the ESM of Leaded Wastes.

4.1.2 Review the current practices and procedures prevailing in the collection, storage and transport of ULAB destined for recycling and devise ways of improving the situation so that ULAB are recovered and recycled in an Environmentally Sound Manner.

4.1.3 Review the Current Practices and Procedures for ULAB recovery in Cambodia and also consider whether a regional solution might be a suitable option. If a regional solution is feasible, consider what mechanisms need to be introduced to ensure ESM of the ULAB when they are in transit from Cambodia to be recycled in another country.

4.1.4 In all cases identify any training needs arising from recommendations made to the above questions.

4.2 Delegate Break Out – Feedback Session

Group 1

In the context of the national laws; that is; the Law on Environmental Protection and Natural Resources Management; the Sub-Decree on Water Pollution Control; the Sub-Decree on Solid Waste Management and the Sub-Decree on Air Pollution and Noise Disturbance; and in the international context of the Basel Convention for the Control of the Transboundary Movement of the Hazardous Waste the recommendations suggested by the group included the following:

(a) Any company that imports lead acid batteries shall be required to request permission to import and also pay a levy on each battery to cover any environmental impacts.

(b) The polluter pays principle shall prevail in the context of lead acid batteries.

(c) Guidelines on the environmentally sound management and recycling of ULAB should be made available to all those involved in the industry.

(d) As far as the requirements for the preparation of draft policies and statutory regulations, the group raised the fact that it will be necessary to implement a capacity building program to strengthen the institutional framework, improve understanding, raise public participation, and increase support from the Government Agencies and also International organizations, such as the SBC and environmental NGOs.

Pic. 13: The View of Respective Discussion Groups

Pic. 14: Question raised by a participant to the First Group Discussion Representative

Group 2

The outcomes of the discussion included the following recommendations:

(a) To promote the use of the BCG to remove the current unsound environmental ractices used by many involved in the recovery of ULAB.

(b) Battery retailers or the supply companies shall buy back ULAB from consumers under a consent agreement the concerned ministries.

(c) There should be an incentive scheme to encourage the battery retailer or the supply company to buy back the ULAB for recovery.

(d) Any battery retailer or supply company who has a permit to buy back ULAB shall abide by the safe working practices outlined in the BCG, including the use of designated vehicles. They will also ensure that the public are aware of the correct way to recover ULAB through the promotion of awareness campaigns, local training courses for lead acid battery sellers/buyers as well as other concerned persons or the dissemination of information through media systems such as the radio, TV, press, children's cartoon pamphlets, magazine articles, and so on.

(e) Build the capacity of technical staffs of concerned ministries and line institutions so that they can apply the appropriate best practices and procedures for the ESM of ULAB.

(f) Follow up the implementation of the ESM of ULAB.

Group 3

The group identified the following options for the ESM of ULAB in Cambodia:

(a) The termination of those ULAB recycling operations with unsound environmental practices.

(b) Set up ULAB recycling centers or enterprises in compliance with ESM.

(c) An ESM system that buys back ULAB from consumers for recovery.

(d) The regional level options could consider:
   i. A discussion of ULAB recovery among the countries in the ASEAN region;
   ii. Closer cooperation and assistance from the SBC;
   iii. Technology transfer, including best practice.
   iv. Education and dissemination of information on the harmful impacts to the public, capacity building for technical staffs, and awareness and promotion of ULAB recycling.

5.0 ACTION PLAN

5.1 Draft Action Plan; Chrin Sokha, Cambodian Ministry of the Environment

Eight key elements form the basis for the NAP for the ESM of ULAB.

The first stage was to complete an inventory of the likely sources of ULAB, with particular attention to the quantities, collection mechanisms, collection rates and possible trends in ULAB use and consumption for the next five years.

Where possible, reconditioners, ULAB melters or smelters and battery retailers were also noted together with summaries of their operations, noting any environmental and health threats.

Environmentally friendly ULAB collection schemes will only be effective if the public is aware of them and the benefits of sound recycling together with an appreciation of the dangers of allowing ULAB to collected and recycled in a way that poses a threat to the environment and the risks the health of the population. Public education and awareness can be raised in any number of different ways, but the key is to ensure that you reach the target audience and those most likely to be at risk if ESM of ULAB is not achieved.

Current regulations for the transport and export of ULAB need to be critically reviewed and strengthened where necessary.

The SBC has published a set of excellent Guidelines that will help to prepare procedures for collection, storage, transport and shipping of ULAB. The Guidelines complement the requirements of the BC for the transboundary movement of HW.

Those sites surveyed that had either reconditioning or melting operations are environmentally unsound, but will be difficult to close down and so will demand considerable effort to persuade the owners of these sites to change their mode of operations.

The NAP will only be effective if it is implemented and there may be a need for further cooperation with other governments, international agencies and funding organizations to develop knowledge, understanding, capacity building and infrastructure.

5.2 National Action Plan for the ESM of ULAB in Cambodia

Taking each element in turn the first requirement was to prepare an inventory.

5.2.1 Inventory

The inventory needs to identify the uses of lead acid batteries and the sources of ULAB. Identifying the uses will automatically identify the sources.

- Automotive – cars, bikes, trucks all imported from the region and sold through battery retailers, cars spares shops and repair shops.
- Computer systems – Uninterrupted Power Supply Units (UPS).
- Remote Area Power Supplies (RAPS) – Schools and Hospitals.

- Domestic Rural areas power supply for TVs and lighting.
- Telephone exchanges and telecommunications – back up power.
- Burglar alarm system - Backup for power failure.
- Fishing and hunting – for electrocuting fish and small mammals.

The survey completed as part of this project has provided invaluable information about the uses of LAB and sources of ULAB, but this information needs to be compiled for each province so that local strategies for the ESM of ULAB can be formalized at local levels.

5.2.2 Workplace and Public Education and Awareness

5.2.2.1 Workshops and Seminars

Education and awareness sessions to inform those handling ULAB of the risks to their health, and the threats to the environment, resulting from poor handling practices and procedures.

These sessions must include an explanation of how to handle ULAB in a safe and environmentally friendly manner. Session should be targeted at:

- Battery Retailers;
- ULAB Collectors; and
- Government Personnel, especially those responsible for the export of ULAB.

5.2.2.2 Poster Campaign

One of the most cost effective ways of raising the levels of public awareness is through Poster campaigns, provided the posters are placed in places where the target groups will see them, read them and remember them. Suggested locations might be:

- Battery retail outlets;
- Recharging shops;
- Garages and repair shops;
- Children's nursery groups; and
- Schools, especially those close to Junk Yards and ULAB Centers.

5.2.3 Policy Development

It is important to examine the existing national and international regulations as well as any statutory instruments applicable to the ESM of ULAB.

Existing national decrees and international conventions need to be invoked and enforced.

Currently, there are no economic incentives to encourage recycling of ULAB, so the government should consult with the battery importers, the manufacturers and the retailers who should be consulted about the introduction of a deposit or discount scheme for the purchase of a new LAB?

5.2.4 Collecting ULAB

There are many ways that ULAB are collected in Cambodia and the evidence is that virtually all ULAB are collected, but the methods of transport to the smelters and the way they are handled prior to and during transit are not conducive to ESM.

By far the most efficient collection system is one that works through the battery retailer where a discount is given against the purchase price of a new battery provided the customer returns the used battery. Sometimes this means that a deposit has to be paid when a new battery is purchased and is only returned to the customer when the battery is returned to the retailer for recycling.

However, the practice in Cambodia is that the retailers do not normally collect the ULAB, so such a scheme should be considered.

Appropriate tamper free collection cages should be considered to reduce the risks from acid spillage.

In the event that such a scheme can be designed the ULAB must be stored in suitable containers or bins to minimise the risk of damage prior to export to a smelter. Ideally the bins or containers will fit easily into the collection vehicle and reduce handling risks.

In this context a public awareness program should be considered in order to publicize any new facilities and maximise patronage.

Specialized or dedicated vehicles make collection of ULAB more efficient, safer and less likely to cause damage to the battery casing, but it is also important to train the drivers of the ULAB collection vehicles in emergency procedures in the event of an accident where there is spillage of battery electrolyte.

5.2.5 Storage of ULAB

Wherever ULAB are stored prior to export, the base of the storage area must be acid resistant concrete or some other suitable flooring. If the store is under cover then an exhaust ventilation system must be installed, or simply a fast air renovation scheme, in order to avoid hazardous gas accumulation ventilation.

The storage area must have drainage channels that run into a collection sump.

ULAB must be stored in a secure compound with restricted access and away from children and animals.

Safety procedures must be observed and employees should be wearing goggles, neoprene gloves, neoprene boots and respirators should be available if necessary.

First aid kits should be available and it is essential to install an emergency shower for use when acid is accidentally sprayed onto the skin or in the eyes.

Every single ULAB should be inspected for leaks, cracks in the battery casing and missing vent caps. Leaking batteries, i.e. those spilling electrolyte, must be stored inside acid-resistant containers. Electronic testing is advised to determine whether the battery could be recharged

and reused. This practice is a legitimate and worthwhile activity because firstly it ensures that any batteries still charged are identified and thereby reduces the risk of sparking during transit; and secondly it returns some batteries to the market without the need for recycling while earning the collector additional income.

Finally, the ULAB should be packaged in preparation for transport or shipping to the smelter.

5.2.6 Transport and Shipping

ULAB must be considered as HW when making arrangements to export them to a recycler. Once again, the main risk is associated with the battery electrolyte that may leak from ULAB in transit.

Observe the "Precautionary Principle" which is based on "Prior Informed Consent" (PIC). For any transboundary movement of ULAB in the region the BC requires PIC and proper documentation is required for the movement of ULAB. Such procedures may not be necessary for domestic movements, but for safety reasons the PIC principle should be considered as an administrative necessity.

It is vital to package the ULAB in a manner that renders batteries easy to move mechanically while reducing the risk of any movement during transit to avoid damaging the battery cases. As a further precaution the Basel guidelines recommend that the ULAB are transported in a sealed shock resistant container that will not leak any electrolyte in the event of unforeseen leakage.

The vehicle used to transport the ULAB, whether it is a ship a truck or a van, must be correctly identified, following international conventions and local legislation using the appropriate symbols and colors to identify the fact that corrosive and HW is being transported.

Each vehicle should have a set of equipment necessary to combat any simple spillage or leakage problems and there should be personal protective equipment available to wear. The appropriate authorities and emergency services should be notified of the transport route and wherever possible a route should be chosen that minimize the risk of possible accidents, avoids populated areas or other specific problems.

5.2.7 Consolidation of Safe Working

In many instances, there are choices to be made, but the environmentally unfriendly activities of any illegal ULAB melters must be terminated and battery reconditioning has to be stopped.

However, there is also a social dimension to this aspect of the Plan. Ways have to be found to encourage those involved in environmentally unsound activities to change their ways and just collect ULAB and export them for recycling. Furthermore, all those involved in the collection of ULAB should be encouraged and trained to provide battery testing, recharging and servicing as a means to maintain an income.

5.2.8 Implementation of the Plan

The Plan cannot be achieved without the cooperation of neighboring countries, especially in the area of border control and the administration of the transboundary movement of hazardous waste. It would be wise therefore to seek cooperation with ASEAN members and those intergovernmental agencies such as the United Nations Conference on Trade and Development (UNCTAD) and the SBC.

Internally, high-level political support is needed from the Departments of the Environment and Health and the Customs Agency.

Implementation of the Plan will also require additional funding and this could be sought through financial mechanisms such as the Global Environment Fund (GEF) under their Clean Water Program and the European Community Program for the Environment. The SBC should be consulted for guidance on this subject.

Appendix I - Workshop Agenda

Time	Contents	Venue	Document
Day 1: 13 May 2004			
7:30 – 7:50	Registration		
8:00 – 8:05	Opening Session National Anthem	Grand Ball Room	
8:05 – 8:15	Welcome and Opening Remarks By ***H.E Chhann Saphan, Secretary of State for the Environment***		ULAB(C)/2
8:15 – 8:30	Key Note Speech By ***Dr. Thanavat Junchaya***, UNEP/SBC Representative, Regional Office in Bangkok		ULAB(C)/3
8:30 – 8:40	The Workshop Agenda By ***Mr. Sreng Sophal***		ULAB(C)/1
8:40 – 9:00	Photo Session		
9:00 – 9:30	Coffee Break		
9:30 – 9:45	Workshop Overview – Objectives and Outputs By ***Mr. Chrin Sokha***	Grand Ball Room	ULAB (C)/4
9:45 – 10:35	Introduction to the Basel Convention and the Obligations of Member Parties By ***Dr. Thanavat Junchaya***	Grand Ball Room	ULAB(C)/5
10:35 – 11:05	Basel Guidelines for ULAB By ***Mr. Brian Wilson***, International Expert of ILMC	Grand Ball Room	ULAB(C)/6
11:05 – 12:00	Introduction to the Project on Inventory of Used Lead Acid Batteries in Cambodia By ***Mr. Chrin Sokha***		ULAB(C)/7
12:00 – 13:30	Lunch Break	Juliana Restaurant	
13:30 – 14:50	Current Situation for New and Used Lead Acid Batteries (ULAB) – Industrial, Domestic and IT By ***Mr. Ken Choviran***	Grand Ball Room	ULAB(C)/8
14:50 – 15:35	Legislation and related awareness/knowledge needs By ***Mr. Sreng Sophal***		ULAB(C)/9
15:35 – 16:00	Coffee Break		
16:00 – 17:00	ULAB – International Situation –Regional Overview By ***Mr. Brian Wilson***	Grand Ball Room	ULAB (C)/10

Day 2: 14 May 2004			
8:00 – 9:00	Main Issues of ULAB Management in Cambodia By ***Mr. Sreng Sophal***	Grand Ball Room	ULAB (C)/11
9:00 – 9:10	Break out session – Group Discussion	Grand Ball Room	
9:10 – 9:30	Coffee Break		
9:30 – 12:00	Group Discussion	Grand Ball Room	
12:00 – 13:30	Lunch Break	Juliana Restaurant	
13:30 – 14:30	Group Discussion (continues)	Grand Ball Room	
14:30 –15:20	Reports Back to Plenary of Group Discussion By the ***Head of each Group Discussion***	Grand Ball Room	
15:20 – 16:00	Coffee Break		
16:00 – 16:30	Action Plan and Summary of Result of the workshops By ***Mr. Chrin Sokha***	Grand Ball Room	ULAB (C)/12
16:30 – 17:00	Closing Speech By ***H.E. Prach Sun***, Under Secretary of State for the Environment	Grand Ball Room	ULAB (C)/13

Appendix - II Delegate List

No.	Name	Institution	Position	Phone Number
1.	Long Yan	Dept. Kandal	Office Vice Chief	**011 957 310**
2.	Som Soeurm	Dept. Compong Chhnang	Office Vice Chief	**016 902 045**
3.	Tuy Si Ngon	Private Sector		
4.	Bun Nguon	MPWT	Deputy Director	**011 875 794**
5.	Sok vuthea	MoE	Office Vice Chief	**016 714 998**
6.	Koeut Saroeun	Dept. Svay Reang	Deputy Director	**012 922 828**
7.	Phay Dara	MIME	Staff	**012 455 238**
8.	Chor Thol	MoE	Staff	**012 430 074**
9.	Ham Sovana	MPWT	Office Vice Chief	**012 937 857**
10.	Ork Bunna	Dept. Takeo	Office Chief	
11.	Mam Chhay Chhan	Dept. Banthey Meanchey	Office Chief	**012 958 932**
12.	Choup Sarun	Dept. Battambang	Office Chief	**012 550 061**
13.	Ros Sikheng	Dept. Pursat	Office Vice Chief	**016 829 121**
14.	Uong Bunal	Dept. Phnom Penh	Office Vice Chief	**012 644 655**
15.	Seng Rathea	Dept. Sihanouk Ville	Staff	**011 782 252**
16.	By Pitou	MIME	Office Chief	**011 826 662**
17.	Sar Song	Municipality of PP	Office Chief	
18.	Mov Wattana	MIME	Staff	**012 597 091**
19.	Anchan Thoeurn	MoE	Office	**011 902 905**
20.	Svay Somana	MoH	Staff	**012 671 207**
21.	Koy Sonin	Dept. Kom Pong Speu	Deputy Director	**016 823 547**
22.	Thiv Sophea Rith	MoE/Ozone	Office Chief	**012 858 509**
23.	Sarun Sambo	MoE	Office Vice Chief	**011 974 485**
24.	Eng Tay Meng	MoE	Office Chief	**012 886 162**
25.	Bun Khunny	MFA&IC	Office Chief	**016 838 966**
26.	Meas Mon	MoC	Staff	**012 872 856**
27.	Bou Bunnara	MEF/Custom and Excise Dept.	Assistance	**012 522 522**

28.	Phet Pichhara	MoE	Office Vice Chief	**012 369 070**
29.	Ean Sokoeu	MoH	Staff	**012 472 470**
30.	Leng Simen	PPWM	Director	**011 750 005**
31.	Chin Sothun	MoE	Office Vice Chief	**011 959 876**
32.	Khat Orstha	PPWM	Staff	**092 822 619**
33.	Bun Khla	MoE	Office Vice Chief	**011 899 631**
34.	Srun Sokhom	DAAL	Deputy Director	**012969 611**
35.	Sourn Punlork	MoE	Staff	
36.	Chhea Marith	MoE	Office Chief	**011 842 846**
37.	Chab Yuthy	MoE	Office Vice Chief	**012 940 279**
38.	Ms. Kiet Sitha	MAFF	Office Vice Chief	**012 895 529**
39.	Kamol Um	MoC	Staff	**012 858 468**
40.	Kong Sokphalakun	MEF/Customs and Excise Dept.	Staff	**012 811 118**