TERMS OF REFERENCE

Better Environmental Sustainability Targets (BEST) For Lead Battery Manufacturers

Lead poisoning and its effects on society

Lead poisoning is one of the most serious environmental health threats to children and is a significant contributor to occupational disease. The World Health Organization (WHO) estimates that 120 million people are over exposed to lead (approximately three times the number infected by HIV/AIDS) and 99 percent of the most severely affected are in the developing world. Over 75 percent of all lead production goes into batteries.[1]

Overwhelming evidence suggests that lead poisoning adversely affects nearly every system in the body and even modest exposures reduce the learning capacity of children and compromise their future potential to contribute to society.[2] While severe lead poisoning can cause coma or death, most overexposed individuals have no obvious symptoms. Millions of children with moderate environmental lead exposures from contaminated air, soil, water, and dust have a negative country-level impact on school performance indicators. Lead poisoning is also linked with hyperactive and violent behaviour in children.

Adult lead poisoning, usually from occupational exposures, also weighs heavily on society. Lead affects the brain, kidneys, blood, and the reproductive system in both men and women. At relatively low levels, lead is known to contribute to high blood pressure.[3] The potential costs of lead poisoning to society are great, which is why many countries have taken steps to address the problem.

Hazards of lead battery manufacturing and recycling

Lead-acid batteries for automobiles, trucks, industrial equipment, photovoltaic solar systems, and backup power supplies are the largest use of lead worldwide. The worldwide market for lead batteries is estimated to be $27.5 billion annually.[4] Approximately 60,000 to 70,000 people are employed in lead battery manufacturing, in addition to a similar number working in mining, smelting and refining.[5]

The demand for lead batteries is predicted to increase for all uses – especially in developing countries where they are often used in areas of intermittent electricity for backup power.[6] New car designs, hybrid cars, and electric vehicles, many of which rely on 42-volt battery

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[1] Personal correspondence from Paul Marsh, Lead Development Association International.
[2] "A Pilot Study of Blood Lead Levels and Neurobehavioral Function in Children Living in Chennai, India" David C Bellinger, Howard Hu, Kartigeyan Kalaniti, Naveen Thomas, Pradeep Rajan, Sankar Sambandam, Padmavathi Ramaswamy, Kalpana Balakrishnan. International Journal of Occupational and Environmental Health, vol. 11/no. 2, Apr/Jun 2005.
[3] "Bone lead and blood lead levels in relation to baseline blood pressure and the prospective development of hypertension: the Normative Aging Study." Cheng Y, Schwartz J, Sparrow D, Aro A, Weiss ST, Hu H. Am J Epidemiol. 2001 Jan 15;153(2):164-71.
[4] Freedonia, "World Batteries", October, 2008.
[5] IC Consultants Ltd, London, England: "Lead: the facts", p.65, December 2001.
[6] IC Consultants Ltd, London, England: "Lead: the facts", December 2001.

systems that are significantly larger than standard 12-volt batteries, are further contributing to rising demand.[7] The expected rise in automobile and computer sales throughout the developing world will fuel future growth in the production and eventual recycling of lead batteries.

Recycling (also known as secondary smelting) lead by melting down used batteries is a common informal sector business throughout the developing world. Unfortunately, recycling lead from used batteries cannot be done safely by micro and small enterprises operating without adequate capital equipment and procedures to minimize emissions.

In many developing countries battery recycling operations are carried out in the informal economy by individuals working on the side of the road or in "backyard smelters." Because of the primitive nature of these operations and their enormous number, estimated to be in the tens of thousands, the control of lead poisoning from the contamination of workers' homes and the environment is a major challenge. In 2008 at least 18 children died and many more were poisoned from lead in Dakar, Senegal after exposure to contaminated dust and soil from the recycling of used lead batteries.

Battery manufacturing is also associated with significant environmental lead emissions. Average exposure levels among children residing near battery plants in developing countries are four times the WHO acceptable level and workers in these plants have approximately twice the recommended exposure.[8] Several mass poisonings from battery manufacturing and recycling have been reported in China. These incidents have affected workers and surrounding residents, some of whom have died or suffer permanent neurological damage as a result of exposure. There are many more examples of lead battery manufacturing sites from around the world that have been the source of lead pollution.

Blood lead surveys in several areas of India have found high percentages of children with elevated blood lead levels (53% of children under 12 years of age).[9] A number of studies have focused on populations near informal lead-acid battery recyclers. These types of facilities have long been recognized as significant sources of lead contamination in the environment and major health hazards to workers and people living nearby.

A recent study in China using data from 2004 to 2007 indicates that 24% of Chinese children have blood lead levels above 10 μg/dL, the current level of concern as defined by the U.S. Center for Disease Control (CDC) and the World Health Organization (WHO). The average BLL for those children living in industrial areas was higher than those living in urban and suburban areas.

Regulatory efforts

Although regulations covering some aspects of lead battery manufacturing and recycling do exist in some developing countries, these efforts are far from comprehensive in scope and implementation is often ineffective. The BEST program complements existing regulations by

[7] All commercially available hybrid vehicles contain lead batteries for starting and other functions in addition to a larger nickel metal hydride or lithium ion battery for powering the electric motor.
[8] OK International, "Review of Environmental and Occupational Impacts of Lead-Acid Battery Manufacturing", March 2003, unpublished.
[9] "Lead in Paint and Soil in Karnataka and Gujarat, India", C.S. Clark, V. Thuppil, R. Clark, S. Sinha, G. Menezes, H. D'Souza, N. Nayak, A. Kuruvilla, T. Law, P. Dave, and S. Shah: Journal of Occupational and Environmental Hygiene, January 2005.

ensuring that participating companies comply with applicable laws. Examples of complementary regulatory efforts from India and China are outlined below.

India's lead battery recycling law

In response to concerns about lead poisoning, the Central Government of India, Ministry of Environment and Forests, promulgated "The Batteries (Management and Handling) Rules, 2001" to stem the flow of used lead batteries into the informal economy for recycling.[10] The rules specifies how manufacturers, importers, re-conditioners, assemblers, dealers, recyclers, auctioneers, and bulk consumers must ensure that used batteries are disposed of in accordance with these requirements and file regular reports to the Government.

Under this regulation, manufacturers, assemblers and re-conditioners are required to ensure that:

- At least 90% of used batteries are collected back against new batteries sold;
- Collection centres are set up for collection of used batteries from consumers or dealers;
- Reports of sale and buyback volumes are filed to the State Pollution Control Boards;
- Used batteries that are collected are sold only to formal sector "registered" recyclers (registered by the state pollution control boards); and
- Recycled lead may only be purchased from registered recyclers.

Despite these regulatory efforts, statistics provided by battery manufacturers demonstrate that the vast majority of used lead batteries are not collected and directed to registered recyclers in India. Several elements work against the effective implementation of this law including:

- a tax structure which favours undeclared transactions in the informal sector,
- lack of enforcement power by government regulators,
- a lack of consumer awareness,
- the large number of backyard smelters, and
- the competitive nature of battery manufacturing that discourages companies from providing incentives to buy back used batteries without the participation of their competitors.

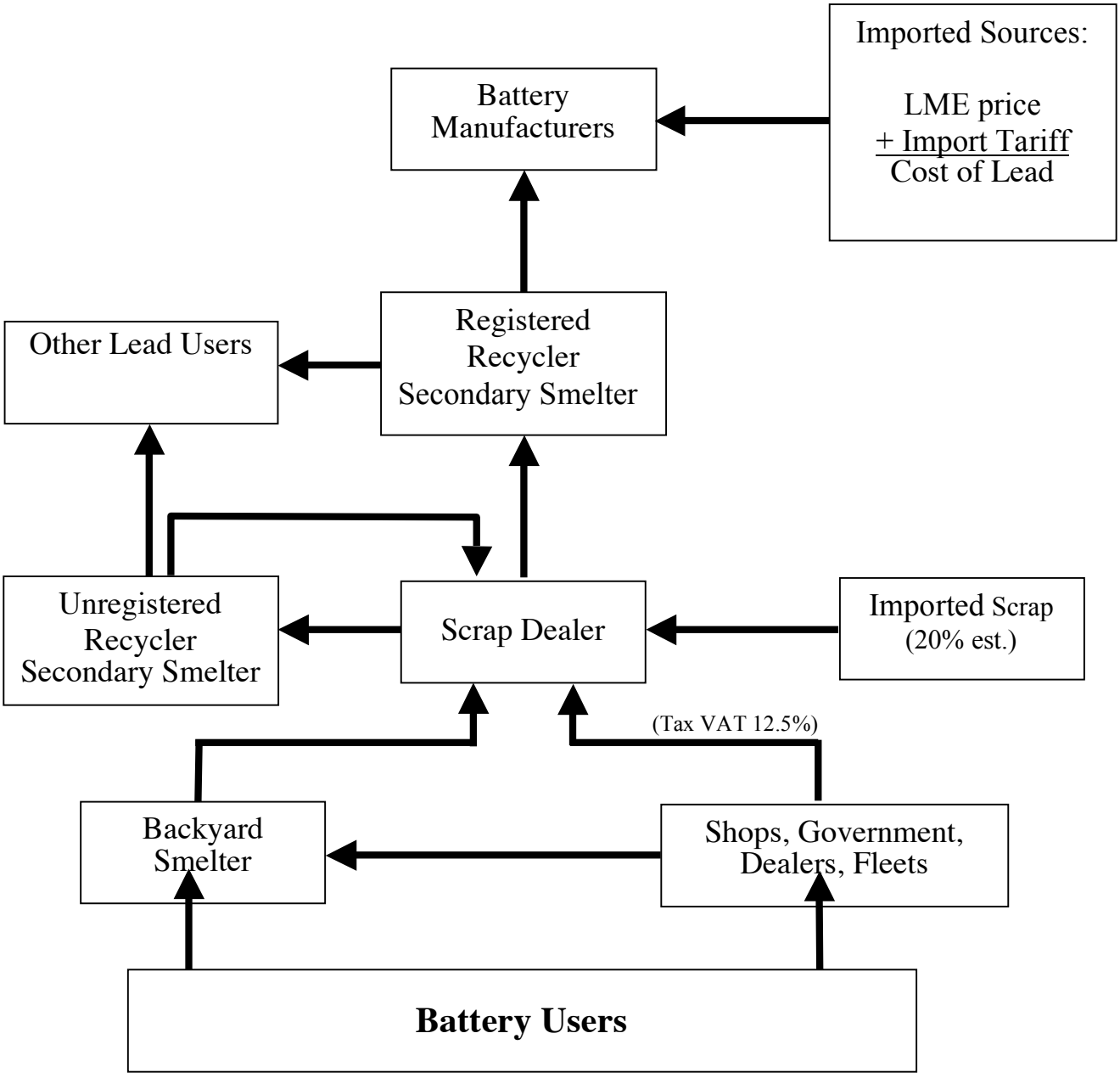
Because of these structural impediments and the enormous number of transactions that occur at the consumer-dealer level, it is unrealistic to expect that existing laws can operate effectively without additional incentives to battery manufacturers and their dealers. As a result, and because of the favourable economics involved, backyard smelters continue to thrive in India with the costs ultimately shifted to society.

This situation adversely affects the supply of lead needed for battery manufacturing in the country. Although India has some domestic mining and primary smelting capacity, it is a net importer of lead as is necessary to feed a rapidly growing battery industry. Much of the lead processed by backyard smelters is low in purity and therefore cannot be used for manufacturing high quality battery plates. In addition, investments in large-scale modern battery recycling plants have not been made in India as they cannot be assured of a sufficient

[10] http://envfor.nic.in/legis/hsm/leadbat.html

supply of used lead batteries to operate efficiently. The lack of a battery collection system and tax structures favouring the unorganized sector are impediments to the development of environmentally sound recycling plants. The importation of used lead batteries is also not officially permitted but government statistics show that some shipments of used lead batteries are imported along with other kinds of scrap. India is importing significant quantities of lead ignots and lead ore to feed primary lead smelters. The existing flow of lead for raw material to battery manufacturers and recyclers in India is depicted in Figure 1.

Figure 1: Lead Lifecycle For Indian Battery Manufacturers and Recyclers



China's lead battery recycling law

A regulation to prevent pollution from the recycling of used lead-acid batteries became effective on March 1, 2010. China's Ministry of Environmental Protection (MEP) issued the "Technical Specifications of Pollution Control for Treatment of Lead-acid Battery (HJ 519-2009) Standard".[11] This regulation outlines requirements for the collection, handling, storage, and recycling of waste lead batteries and provides guidance to recyclers on site selection and facility pollution controls. The regulation extends producer responsibility with mandatory collection of used lead batteries and mandates that collected battery waste can only go to recycling facilities approved for operation by the government.

Additional requirements include:

- Battery recycling facilities must have a lead recovery rate of 95% for existing factories and no less than 97% for new factories;
- Existing recycling facilities must have a capacity of at least 10,000 tons per year to be allowed to continue to operate;
- New lead battery recycling facilities must have capacities of at least 50,000 tons per year; and
- Recyclers must have appropriate worker training, supervision, and assessment.

The BEST Program

A partnership was formed between international NGOs, government, and industry to respond to the lead poisoning epidemic. These parties came together with a common goal to improve the health and educational opportunity of millions of children around the globe. The partnership developed an environmental certification program to reward lead battery manufacturers that meet minimum emission standards and agree to take back used batteries for environmentally sound recycling. The objective is to reduce emissions from these plants, discourage backyard recycling, and thereby prevent lead poisoning.

The Better Environmental Sustainability Targets (BEST) program is designed to restructure the incentives that drive industry behavior. Environmental standards for the lead battery industry are being developed in partnership with the battery industry, major battery purchasers, NGOs, government, and other experts. The goal is to encourage companies to adopt improved pollution control measures by offering an eco-labeling program as an incentive. Participating companies will agree to meet minimum emission standards and to take back batteries for proper recycling. An accredited local auditor will conduct an annual assessment to verify compliance with minimum performance standards. Companies that meet these standards are eligible to place eco-labels on their batteries. The program is sustainable by generating revenues from licensing fees for displaying the certification label based on production volume.

The BEST lead battery certification is currently being implemented in India and China, and because the industry is fairly uniform with similar inputs and outputs throughout the world,

[11] http://english.sepa.gov.cn/inventory/Catalogue_Standards/201004/t20100429_188941.htm

the standard is intended to be applied internationally. It is important to gain recognition for the standard beyond these countries as the market for lead batteries is increasingly operating on a global scale.

Implementation Plan

Starting in April 2006, a multi-stakeholder panel is convening to set the environmental standards for lead battery manufacturers. The BEST standard shall include specific performance criteria for environmental lead emissions, occupational lead exposures, and other environmental criteria including energy consumption, emergency preparedness, and waste reduction programs. In addition, a voluntary system for taking backed used lead batteries shall be developed.

OK International has accredited individual auditors and provides oversight over the process and use of the eco-label. In addition, the organization is responsible for maintaining and updating the standard in accordance with agreed upon procedures outlined in a governance charter. An eco-label can be displayed by qualifying companies that have successfully completed an independent audit.

The governance structure of the BEST certification, was developed with input from a multi-stakeholder panel brought together to represent the interests of industry, major purchasers, affected communities, governments, and NGOs. The governance of the organization is based on a specific formula to facilitate the participation of key stakeholders in the ongoing implementation of the program. This type of governance structure is used by most independent accreditation bodies covering fair labor practices, sustainable marine fisheries, and other similar efforts.

BEST Objectives

In response to the lead poisoning epidemic and the inability of existing regulatory structures to correct deficiencies in the market, a multi-stakeholder group is developing a "Lead Battery Manufacturing Plant Environmental Standard" to be used to conduct environmental audits of lead battery manufacturing facilities for a third party verification system. The objectives of this environmental standard for lead battery manufacturing plants are as follows:

Objective 1: Reduce lead exposures in communities where lead batteries are manufactured.
Objective 2: Reduce lead exposures and improve the health status of employees of lead battery manufacturing facilities that are occupational exposed to lead and other hazardous materials.
Objective 3: Increase the adoption of sustainable practices in order to reduce the environmental impact of lead battery manufacturing by encouraging efforts to minimize waste, lower emissions, reduce energy and water consumption, and encourage environmentally sound recycling.

The BEST "Lead Battery Manufacturing Plant Environmental Standard" shall provide the performance criteria to evaluate the environmental performance of lead battery manufacturing facilities against these objectives. However, the standard will not address recycling, transport, or other portions of the lead supply chain including mining, primary smelting, or mineral

processing. The standard will also not address wages, working conditions, or other social criteria not directly related to occupational health.