

## Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

20 November 2012

### Forty-second session

Geneva, 3 – 11 December 2012

Item 2 (c) of the provisional agenda

**Recommendations made by the Sub-Committee on its thirty-ninth,  
fortieth and forty-first sessions and pending issues: electric storage systems**

## **Illustration of current practices in the collection of waste lithium batteries**

**Transmitted by PRBA – The Rechargeable Battery Association and  
RECHARGE - The International Association for the Promotion and  
Management of Portable Rechargeable Batteries**

### **Introduction**

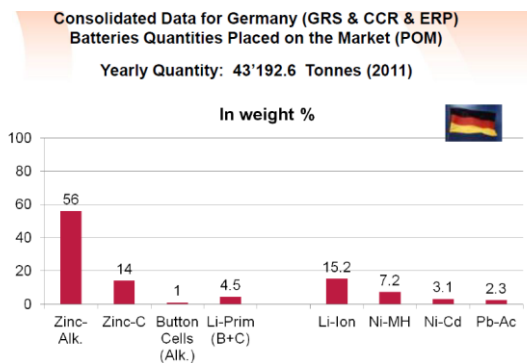
1. PRBA and RECHARGE working paper ST/SG/AC.10/C.3/2012/86 provides for a new Special Provision XXX and Packing Instruction P903a for transporting lithium cells and batteries for disposal or recycling with or without non-lithium cells and batteries.
2. ST/SG/AC.10/C.3/2012/86 contains packaging provisions that have been successfully implemented in the United States and in Europe in accordance with ADR where several tenth of thousands of Tonnes per year of batteries have been safely collected and transported for disposal or recycling.
3. This INF paper is aimed at supporting ST/SG/AC.10/C.3/2012/86 by providing an illustration of the following elements related to battery collection activities and programs:
  - The current ratios of lithium batteries placed on the market compared to other battery chemistries in two major EU countries;
  - Examples of poor packaging practices observed when non-conforming packaging are used; and
  - Examples of good packaging practices that are used by several National Collection and Recycling Schemes and their logistic partners (collective or private).
4. We believe these illustrations will help the Sub-Committee to focus the discussion on practical cases in order to better understand the proposals contained in ST/SG/AC.10/C.3/2012/86.
5. This paper has been prepared in cooperation with the following battery collection organizations in Europe and their partners: BEBAT, STIBAT, GRS.

**1.a. Market date**

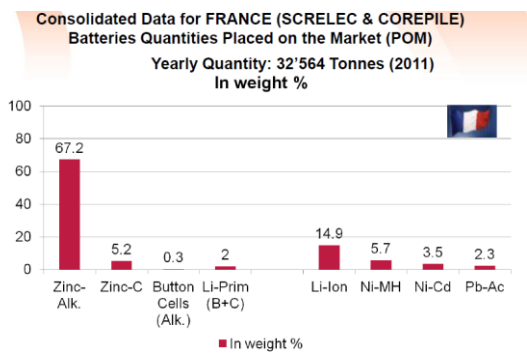
**Quantity of Portable Batteries (Primary and Rechargeable) Placed on the Market in Germany and France (2011).**

The Lithium battery ratio of batteries placed on the market is < 5% for Lithium Metal and 15 % for Lithium-Ion.

**Figure 1 ( Germany)**



**Figure 2 (France)**

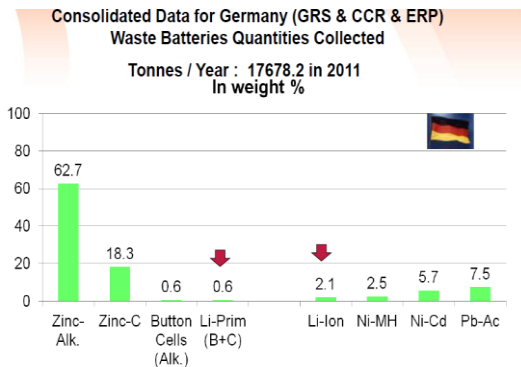


**1.b. Collection data (EU)**

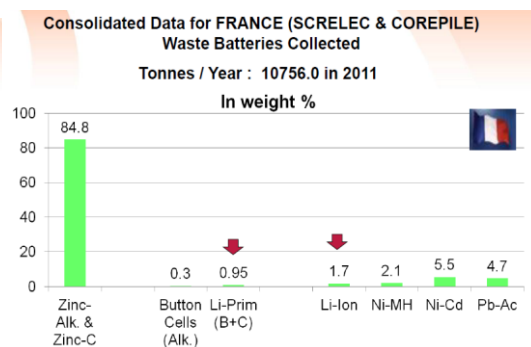
**Quantity of Waste Portable Batteries (Primary and Rechargeable) collected in Germany and France (2011).**

The Lithium battery content of collected waste batteries is < 1% for Lithium Metal and 2 % for Lithium-Ion.

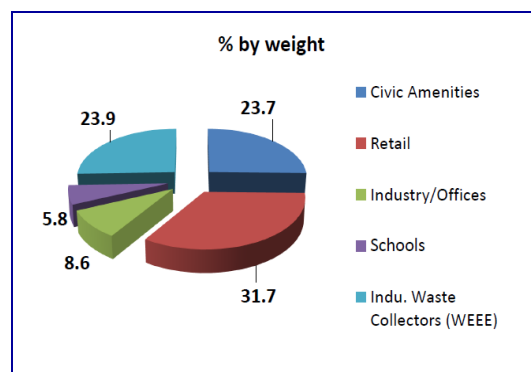
**Figure 3 (Germany)**



**Figure 4 (France)**



**Figure 5**



**Major collection sources for waste**

**Batteries discarded by consumers**

**(Representative of 25'000 Tonnes in 11 EU Member States) >>>>**

## 2.a. Bad practice

2.1 Lithium cells not individually protected against short circuits and pack without protection against movement during transport.

**Figure 1**



2.2 E-Bikes Batteries individually protected against short circuits but packed without protection against movement during transport.

**Figure 2**



2.3 Disassembled packs represent a major source of hot spots due to short-circuits and residual energy stored in the battery.

**Figure 3.**



## 2.b. Recommended practice

2.4 When individual cells are not protected, the use of a cushioning material is appropriate.

**Figure 4.**



2.5 E-Bikes Lithium Batteries individually protected against short circuits and packed against movement during transport by using cushioning material. NB Cushioning material will fill completely the voids in the packaging.

**Figure 5.**



2.6 Individual protection is required to minimize risks.

**Figure 6.**



**3. Other examples of good practices**

3.1 Covering the batteries with vermiculite (filling voids in the container).

**Figure 1.**



3.2 Use of a closed plastic liner and vermiculite to avoid the movement of batteries during transport

**Figure 2.**



3.3 Examples of waste battery individual packaging with a plastic bag

**Figure 3.**



3.4 The principle of using cushioning material in a multilayer arrangement.

**Figure 4.**



3.5 Sand is also used as a cushioning material to stabilize the batteries during transport and protect against short circuit

**Figure 5.**



3.6 Keeping Lithium Primary Batteries in a blister is a safe practice

**Figure 6.**



#### 4. Collection tools (EU)

4.1 Between First Collection point and First Consolidation facility (Exempted)

The 20 l to 30 l cardboard box used in sales points for consumer batteries.

**Figure 1.**



The 60 l drum used in schools (e.g.).

**Figure 2.**



The 60 l (and others) drum(s) for transport of waste batteries from the first consolidation point to further sorting or processing (PG II Performance Level).

**Figure 3.**



4.2 Between First Collection point and Further treatment facility (sorting of processing)

The 60 litres drum for transport of waste batteries from the first consolidation point to further sorting or processing (PG II Performance Level).

**Figure 4.**



4.3 Appropriate Labelling

For all shipments, information about the Lithium battery content should be made visible on the packing.

**Figure 5.**

