

Collection of spent batteries in Rome

Alessandro Muzi

Azienda Municipale Ambiente, Rome Municipality, Rome, Italy

Abstract

The structure and the motivation of the Environment Municipal Company of the City of Rome, as well as the efforts of this Company in promoting separate collection of torch cells and lead accumulators, are illustrated and discussed.

Keywords: Recycling; Italy; Lead/acid batteries; Torch cells

1. Introduction

In order to face the problem of urban battery waste collection, it is necessary to define the context in which the Azienda Municipale Ambiente (AMA), i.e. the Environment Municipal Company of Rome, operates. Since 1987, the municipality of Rome has been carrying on its institutional activity for waste collection using a company called AMNU (Azienda Municipale Nettezza Urbana, Municipal Company for Urban Waste Collection) on its territory of about 1500 m² where 2 975 000 people live, and not to forget the effects of the dimension of the metropolitan for the town-planning characteristics assumed during the last two decades. The company is working on 25 000 000 m² of road surface with 6515 employees who, using 1800 locomotion means of different kinds, move every day more than 100 000 containers of different types, opportunely installed in its territory and conceived in accordance with the different types of waste to be collected. Every day, about 4500 tons of urban solid waste are collected, removed and carried to the plants for their final disposal.

In June 1994, a new legal entity with contracting management purposes, i.e. the AMA Company, was established. With AMA, also a new strategy of waste disposal was born, i.e. the 'waste minimization strategy', which is based on the following:

- (i) to reduce the waste production (office paper, packings, etc.) at the origin;
- (ii) to differentiate the way of collection according to the different nature of waste (glass, paper, plastic, aluminium, iron materials);

- (iii) to re-utilize materials (glass bottles and components);

- (iv) to recycle useful materials (glass, paper, cardboard, ferrous materials, and compost);

- (v) to regenerate the energy contained in the fuel waste which could not have been used otherwise, by defining the use of disposal site as the final stage of the disposal cycle and by minimizing its role with respect to the environment, and the influence of pressure groups.

The collection of dangerous urban waste (batteries, medicines and syringes), started in 1987; the collection of glass, started in 1989, have recently been supported by an experimental 'multimaterial collecting' plan organized by placing, in some pilot areas of the city, special containers (blue boxes) in which different types of dry waste (paper, plastic, aluminium, glass and iron materials) can be collected. This initiative should allow to face the situation in more competitive economic terms than those based on previous separate methods. In particular, this initiative should allow the proper collection of spent torch cells and lead accumulators to be simplified.

2. Collection and disposal of torch cells

2.1. Legislation

In 1991 the Council of the European Economic Community (EEC) issued a special regulation in order to harmonize the laws of the Member Countries with regard to disposal and recycling of batteries and accumulators containing dangerous materials. This regulation, subdivided into three fundamental points, imposes that:

(i) from 1 January 1991 on, the sale of torch alkaline cells with more than 0.025 wt.% mercury is forbidden;

(ii) remaining torch cells and all the button cells must have a particular label if they contain more mercury, cadmium and lead than the fixed limits. The label must contain all information on the percentage of heavy metals and on the recommended collection (by a deposit system, if it is necessary) to allow their proper disposal;

(iii) spent cells can be disposed of in the urban waste system if the percentage of heavy metals is lower than the fixed limits.

This regulation has been assimilated in Italy by issuing the bill 253 (11 May 1994) which confirms that the sale of torch cells with more than 0.025 wt.% mercury is forbidden. In addition, the bill, in accordance to the procedures listed in a decree issued by the Minister of Industry, imposes a label also for those batteries which, having no heavy metal, can be disposed of as solid urban waste.

According with the bill, all button cells must have a label showing that the percentage of heavy metals is higher than the fixed limit of 0.025 wt.%. In addition, on each of those cells a deposit of 500 Italian liras shall be imposed, to sustain their return to the shop, and therefore, to assure their separate disposal.

On the whole, the Italian bill is more restrictive than the EEC regulation. In fact, the bill forbids the marketing of torch cells and it imposes a label on those cells that can be disposed in the ordinary urban waste system. The benefit is that the double mark gives clearer information to the user, and that it contributes to avoiding improper forms of disposal.

Finally, it has to be considered that, the battery industry has somewhat anticipated the environment conscience of the law makers, by launching an opportune promotion to put on the market 'ecological' products which allow a more immediate operative and logistic approach to the waste problem. Thanks to the technological progress, cells with low or even no heavy metals content can now be produced. Indeed, these 'ecological' cells have been put on the market since 1990 and thus, even more restrictive measures by the law maker are expected since it would seem reasonable to impose the marketing of only those cells that are heavy metal-free.

2.2. Collection procedures

To accomplish the Italian regulation on the battery collection, a special service has been set up in Rome with the help of means created and authorized by control authorities. The service assures that the collected material, defined as toxic and harmful, is finally disposed of in special sites of second category, type C. Three phases of this service can be distinguished: collection; transport, and arrangement after inertization.

The service is provided by the installation of containers in the 66 seats of the city area and in twelve equipped intermediate areas territorially diffused in the twenty districts of Rome, as well as three factories which, at present, the AMA

company has at its disposal. Furthermore, other containers are installed in municipal schools and in the USL (the Italian Health Service) seats. The company also uses a service on call and a free telephone line to receive communications and requests for service. Finally, suitable promotions towards the proper category associations, are in progress with the aim of starting plans concerning the arrangements of containers near specialized commercial activities that use a considerable quantity of batteries.

To optimize the collection plan, it appeared to be important to combine, in a single equipment, both the containers for the collection of the exhausted batteries and the containers for the collection of other differentiated waste. The company has experimented this concept by installing the battery containers next to the glass containers which, thanks to their special bell-shaped design, about 3400 battery collection points are set up. Unfortunately, the experiment did not achieve the expected results because of the very high number of damages and breaks caused by the univocal way of displacing the bell, and mainly, because of the low response from the public. In fact, in schools where suitable campaigns have been pursued, better results have been obtained. Other problems are related to the gap between the narrowness of the commercial distribution of the product and the site of containers, and to the difficulty in finding an effective link between topographical parameters for consumers and an adequate economic value of the service.

3. Collection and disposal of lead accumulators for traction

3.1. Legislation

According to the Italian law, the producers of lead accumulator waste (for example mechanical repair garages and distributors) must arrange the correct disposal. They can benefit of the bill 475/88, which authorized the institution of COBAT, i.e. a Consortium devoted to the collection and recycling of lead accumulators. The aim and the structure of this Consortium are given in Ref. [1].

3.2. Collection procedures

For the main activity of collecting and recycling exhausted lead accumulators AMA has signed an agreement with COBAT. Furthermore, the Company has created and organized in the city area 40 collection centres where private users can dispose of their spent products. These centres collect the waste products of the firm maintenance activity, products left in the territory and products coming from the activity of municipal sister firms of the neighbouring area, as well as domestic waste.

Although in general satisfactory, the collection of lead accumulators is still affected by some problems. Even if buying a car battery in large commercial centres or in hyper

markets is not common, the maintenance of car made by private persons is instead very common. Often, these persons do not follow the instructions. An information campaign has been launched jointly by AMA and COBAT with the aim of encouraging people to respect the environmental measures by providing them the possibility of making use of easily

reachable centres which are properly equipped for the collection of garbage.

Reference

- [1] C. Sancilio, *J. Power Sources*, 57 (1995) 75–80.