

Situation in the European Community and Germany concerning regulations about used batteries with an outlook on other countries

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Abstract

In 1991 the European Community 'Batteries and accumulators containing dangerous substances' has been adopted. It contains stringent requirements (e.g. concentration of mercury and labelling of some specified batteries) and recommendations. The various national governments have to implement the EC Directive to serve as a framework for their national law. In the future, the Battery Ordinance applicable in Germany will have to be seen against the background of the existing Waste Act, the more detailed administration regulations, the new Waste Management Act (to come into force in 1996) and the self-commitment by producers/retailers. The different regulations are briefly described. A short survey of measures taken in other European countries is given.

Keywords: Regulations; European Community; Germany; Spent batteries

1. Introduction

In the late seventies or early eighties, roughly at the same time, Switzerland and Germany tackled the problem of 'batteries'. Not in general but only the special case of 'mercury oxide batteries'; nevertheless, it was the beginning of a discussion. In Germany, the result was a self-commitment of battery manufacturers and importers.

The aims were:

- to diminish the production in the long term
- to take care of the collection of batteries in collaboration with the distributors
- to inform the Federal Environmental Office in Berlin of production and import figures, and, of the quantities of mercury oxide batteries collected.

Today this first commitment is only of historical interest, but it was the root of further discussions and investigations in Germany about:

- mercury in alkaline and zinc-carbon batteries
 - cadmium in Ni-Cd accumulators
 - lead in lead/acid batteries
- or for all questions with reference to batteries in general.

In other countries a similar trend has been observed.

2. European Community

In 1991, EC Directive 91/157 (EC Directive on batteries and accumulators containing dangerous substances) has been

adopted. Incidentally at this time, the international battery manufacturers succeeded in the development of a new alkali manganese battery containing less than 0.05 wt.% mercury, see Table 1.

The EC Directive 93/86/EEC provides detailed prescriptions regarding the labelling of batteries covered by the 91/157/EEC. Table 2 summarizes the main aspects. The Directive will only be applied to the following batteries: (i) button cells containing mercury; (ii) nickel-cadmium accumulators, and (iii) lead/acid accumulators, including car batteries. In fact, these categories of equipment batteries are responsible for nearly the whole amount of mercury, cadmium and lead in consumer batteries. It is obvious that these toxic metals will contaminate the soil, air and water, and that special regulations for disposal or recycling are compulsory. In addition to the Directives 91/157/EEC and 93/86/EEC, some other regulations have to be taken into consideration, see Table 3.

Some questions arise:

- Discouraging the use of batteries
- Introduction of extended responsibility of the manufacturer by means of a take-back obligation of certain battery systems
- Consideration of the trade as the 'gate-keeper' in the distribution and redistribution chain (consumers' information, points of sale, recollection, etc.)
- Conditions that are necessary for an efficient and environmentally friendly recycling of spent batteries

Table 1
EC Directive on batteries and accumulators containing dangerous substances (91/157/EEC)

Demands

- Reduction of the heavy metal content
- Promotion of batteries containing no or less dangerous substances
- Promotion of research on environmental friendly and safe battery systems
- Mercury concentration ≤ 0.025 wt.% in alkali manganese batteries, except button cells
- Built-in batteries should be easily replaceable after lifetime

Labelling

- The following batteries must be labelled if they contain:
 - more than 25 mg of mercury per cell, except for alkali manganese batteries
 - more than 0.025 wt.% cadmium
 - more than 0.4 wt.% lead, and alkali manganese batteries that contain more than 0.025 wt.% mercury
- The label denotes: separate collection, recycling, content of heavy metals
- Equipment with incorporated batteries has to be labelled

Recollection/disposal

- Member States have to take measures in order to provide for selective collection and separate disposal of the labelled batteries
- Member States are called for the realization of an effective and selective recollection system. This may be supported by the introduction of an obligatory deposit/refund scheme

Recycling/re-use

- Promotion of research on recycling processes

Information

- Member States have to take measures for the promotion of consumer information campaigns

- Redistribution of the additional costs caused by separate collection and proper disposal
- Sorting of mixed batteries
- Consumers' dealing with non-labelled batteries.

The European Community has not solved yet the problem completely. The Directives are only the framework for more or less different national solutions. This point will be further discussed later on.

3. Germany

In 1988, a voluntary self-commitment concerning the disposal of spent batteries was agreed upon by the organization of battery manufacturers and importers (Fachverband Batterien in Zentralverband Elektrotechnik- und Elektroindustrie e.V., 'ZVEI') and the trade organization (Hauptgemeinschaft des deutschen Einzelhandels, 'HDE'). All important battery suppliers to the German market – VARTA, Daimon-Duracell, Ralston, Philips, Panasonic – are members of ZVEI.

It was no coincidence that the self-commitment took place just at this time because: (i) the battery producers of Europe, USA and Japan had decided to eliminate mercury from alkali manganese batteries along gradual lines; (ii) in Brussels, the battery Directive was dealt with at that time, and (iii) a strong battery ordinance was impending in Germany. All three events were interrelated.

This commitment is still in force (see Table 4).

So as the directive was going to be implemented, all problems which were not yet solved in Brussels came up. Meanwhile, a third draft for a battery decree in Germany is being discussed.

Table 5 summarizes the essential topics of the draft of the German battery decree, dated June 1992.

Comparing the EC Directive with the German draft version of the decree there are two striking differences concerning the following aspects: (i) field of application, and (ii) introduction of a deposit refund scheme.

The take-back obligation, as it is formulated in the German draft version of the battery decree, is not confined to labelled batteries, but also includes non-marked batteries. This general take-back obligation is justified by the need to avoid 'mis-throws': if the take-back duty only covers the labelled ones, there is a risk that the consumer discards not only batteries with a low content of hazardous substances (non-labelled) along with the domestic waste, but also batteries containing a high content of dangerous substances (labelled). However, the general take-back obligation does not imply a general recycling duty for all collected batteries.

This is the crucial point of the draft. Having a general take-back obligation, one has either to sort the batteries, that includes the problem how to dispose of 80% of them (the zinc-carbon and alkali manganese batteries (see Table 6)), or to choose a process for the recycling of the battery mix. Between these two extreme positions many intermediate stages are possible. The question of a 'deposit' is not necessarily connected with a general take-back obligation, but the alternative, 'either deposit for batteries containing dangerous substances or no deposit and a general take-back obligation', is clear.

The legal basis for the battery decree – besides the EC Directive – is the German Waste Avoidance and Waste Management Act, §14 (Abfallwirtschaftsgesetz), that pursues as its main objectives: (i) reduction of the amount of domestic waste; (ii) reduction of hazardous substances in domestic

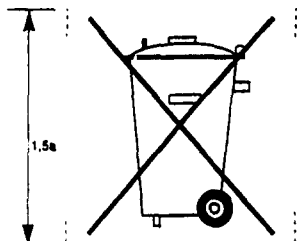
Table 2
EC Directive 93/86/EEC for the amendment of Directive 91/157/EEC to technical processes

Labelling

- Separate collection should be indicated by a label which consists of a crossed-out dustbin
- The content of heavy metals should be indicated by the chemical symbol of the respective substance
- The producer of batteries or the institution that is in charge of the placing on the market, is responsible for the labelling.

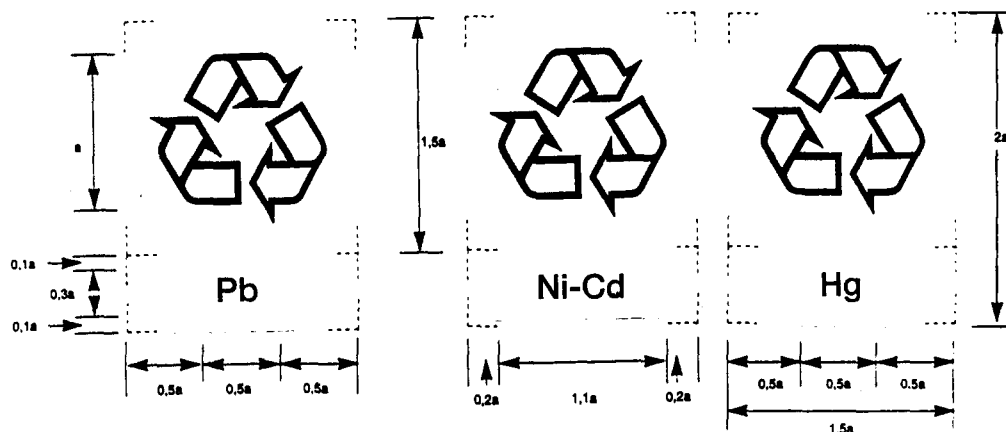
Label

Label included in the EC Directive 93/86/EEC for the amendment of Directive 91/157/EEC to technical processes



ISO recycling symbol

ISO recycling symbol 7000-Reg. No. 1135, not outlined by the European Community, but favoured by battery industry



waste; and (iii) a greater responsibility of the manufacturers.

The realization of the Waste Act objectives is explained in a more detailed way in the so-called 'Verwaltungsvorschriften' (administrative regulations). In the case of used batteries

Table 3
Environmental regulations in the European Community

91/157/EEC	Batteries
93/86/EEC	Labelling of batteries
75/442/EEC	Disposal of waste
91/156/EEC	Disposal of waste
91/689/EEC	Dangerous waste in general
94/904/EEC	List of dangerous wastes
76/464/EEC	Aquatic environment
80/68/EEC	Groundwater
89/369/EEC	Incineration

two administrative regulations are important: (i) 'Technische Anleitung Abfall', TA Abfall (technical instructions on waste) and (ii) 'Technische Anleitung Siedlungsabfall', TASI (technical instruction on municipal solid waste).

The 'TA Abfall' applies to waste requiring particular monitoring, i.e. hazardous waste. It contains regulations with regard to technical and organizational conditions on storage, chemical, physical and biological treatment, incineration, and final disposal of the dangerous waste. The 'TA Siedlungsabfall' is committed to waste caused by private households and contains general regulations on product recycling and reduction of hazardous substances by: (i) reducing the content of dangerous substances in the waste to a minimum; (ii) recycling of unavoidable waste as far as possible, and (iii) the final disposal of non-recycleable waste.

Both regulations concern batteries and materials used in batteries and their appropriate disposal. It shows that no used equipment batteries may be disposed of in domestic waste landfills (see Table 7).

Table 4
Main aspects of commitment by industry and trade concerning used batteries, 1988

Product modification and innovation	Production and development of batteries containing less or no dangerous substances Development of substitutes for environmentally harmful battery systems, especially mercury oxide cells Reduction of the mercury content in alkali manganese batteries (0.15 wt.% in 1988, 0.10 wt.% in 1990 and less than 0.10 wt.% of mercury in 1993)
Labelling	Labelling with the ISO recycling symbol 7000-Reg. No. 1135 of the following systems: sealed nickel-cadmium accumulators, starter batteries, button cells containing mercury, and alkali manganese batteries containing 0.1 wt.% or more of mercury
Recollection/disposal	Retailers and producers commit themselves to take back the labelled batteries
Recycling/re-use	The manufacturers have to build up facilities that ensure the recycling of the hazardous substances in the batteries
Information	Traders and manufacturers/importers are responsible for consumers' information The Minister for Environment is to be informed annually on the actual status of the realization of the commitment
Period of validity	The commitment is valid until the government will lay down a regulation on batteries, i.e. a battery decree

Table 5
Main aspects of the German draft regulation on used batteries

Product modification and innovation	Further reduction of the heavy metal content Since 1 January 1993, special purpose alkali manganese batteries put on the market that contain more than 0.05 wt.% mercury and all other alkali manganese batteries contain more than 0.025 wt.% mercury have been prohibited. Exception has been taken for alkali manganese button cells Since 1 January 1994, it has been allowed to build in batteries only in cases in which the battery can be easily replaced
Labelling	Labelling of batteries that have been put on the market after 18 September 1992 and that contain: (i) more than 25 mg of mercury per cell, except for alkali-manganese batteries (ii) more than 0.025 wt.% cadmium (iii) more than 0.4 wt.% lead (iv) alkali manganese batteries, that contain more than 0.025 wt.% mercury Equipment with batteries incorporated will be labelled
Recollection/disposal	Manufacturers and retailers are obliged to take back all used batteries Retailers have to keep the labelled batteries separate from the non-labelled batteries Non-recycleable batteries have to be disposed of according to the waste legislation
Recycling/re-use	As a matter of priority spent batteries and battery materials are to be recycled/re-used

Table 6
Equipment batteries sold in Germany, 1992

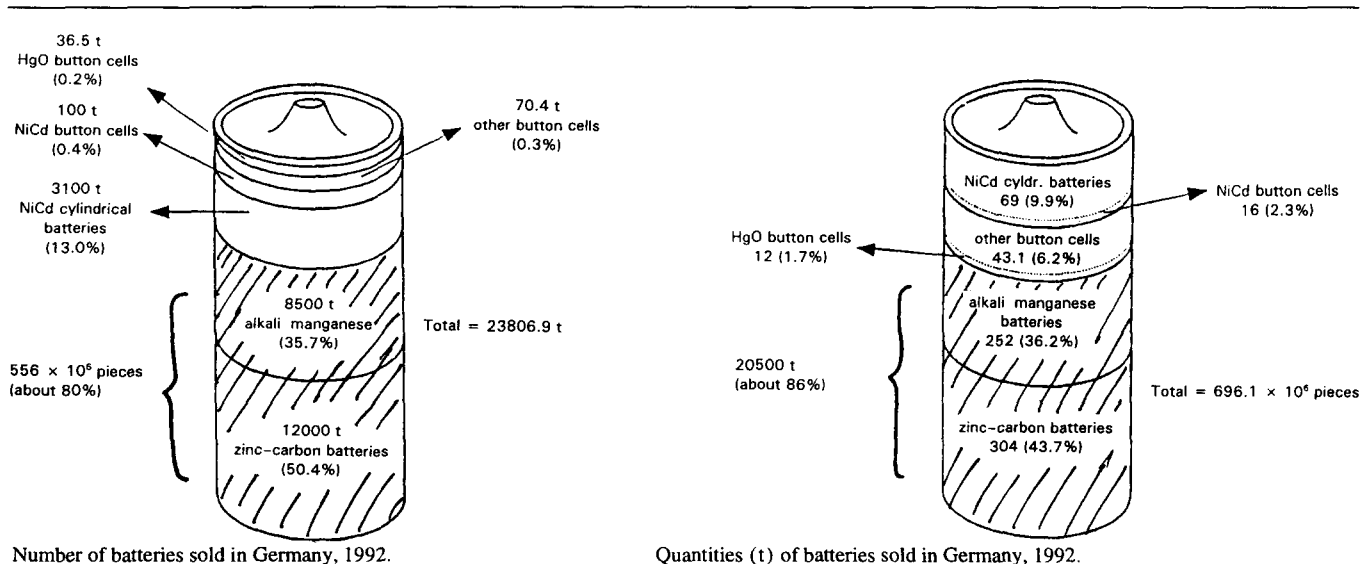


Table 7
Batteries and battery substances that are regulated by the 'TA Abfall' and 'TA Siedlungsabfall'

Battery (substance)	Preferred disposal
Nickel–cadmium accumulator	Sub-soil dumping site
Batteries containing mercury (independent of percentage of mercury)	Sub-soil dumping site
Dry batteries (zinc–carbon batteries, alkali manganese batteries)	Hazardous waste landfill
Manganese oxide	Hazardous waste landfill
Zinc oxide, zinc hydroxide	Hazardous waste landfill
Ammonium chloride	Sub-soil dumping site
Acid from accumulators	Chemical/physical or biological treatment

Table 8

Country	EC Battery Directive implemented	Other measurements	Deposit-refund	Labelling
Italy	No	Obligation to take-back Responsible: local community Mainly in northern Italy	Proposed for button cells and accumulators	Proposed
Denmark	Yes	Obligation to take-back Responsible: local authorities, and public institutions Collecting of Ni–Cd batteries	Ni–Cd batteries and built-in Ni–Cd batteries	?
Belgium	No	?	In preparation	?
The Netherlands	Yes	Chemical Waste Act: Batteries are hazardous waste, and need a special disposal	Will come in force, if a certain recycling rate cannot be reached	?

In 1994, the 1986 Waste Act was superseded by the Closed-Substance Cycle and Waste Management Act (Kreislaufwirtschaftsgesetz). It will become effective in 1996. It underlines the 'close-loop economy' (Kreislaufwirtschaft). As a further consequence, the draft regulation on spent batteries is going to be modified in the near future.

4. Other countries of the European Community

Less information concerning battery policy and measures is available in other countries. A short survey is given in Table 8.