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Fundación para la Gestión Medioambiental de Pilas

Ecopilas Foundation
A Collective Scheme of wasted batteries

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RECYCLIA, our environmental platform bringing together WEEE and batteries compliance schemes

WEEE compliance schemes (TRAGAMÓVIL, ECOFIMÁTICA and ECOASIMELEC)

Batteries compliance scheme (ECOPILAS)

- Response to **producer responsibility principle** over waste generated at the end-of-life of the products they place in the market.
- **Alllow producers** to easily and economically **comply** with WEEE and Batteries regulation.

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- Aparatos eléctricos y electrónicos
- Equipos ofimáticos
- Pilas y baterías
- Telefonía y comunicaciones

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Batteries Legislation

- ✓ Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators

- ✓ ROYAL DECREE 106/2008 of 1 February 2008, on batteries and accumulators and environmental waste management

European Framework

Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators

Main Directive points:

- Directive 91/157/EEC is repealed
- Establishes rules prohibiting the marketing of batteries and accumulators containing certain dangerous substances (mercury and cadmium).
- Promotes the appropriate treatment, recycling and disposal of waste batteries and accumulators.

Spanish Royal Decree

ROYAL DECREE 106/2008 of 1 February 2008, on batteries and accumulators and environmental waste management.

Affects all "batteries ***producers***

- Manufacturers
- Importers (EU and overseas)
- Retailers

Affects all Kind of portable batteries and accumulators with no exceptions.

Main Aspects

1. Marketing batteries containing a **certain amount of heavy metals** (Hg and Cd) is forbidden.
2. **Producer responsibility** principle.
3. Includes rules for the appropriate management of batteries waste (collection targets and % efficiency in recycling.)
4. Financing mechanisms are regulated.

Mercury related issues in the RD 106/2008 (I)

CHAPTER II Obligations of the operators.

Article 4. ***Prohibitions.***

3. a) all batteries or accumulators, whether or not incorporated into appliances, that contain **more than 0.0005% of mercury by weight**;

4. The prohibition set out in paragraph 3(a) **shall not apply to button cells with a mercury content of no more than 2% by weight.**

Mercury related issues in the RD 106/2008(II)

Prevention - Article 13. ***Measures for prevention, increased environmental performance of batteries and accumulators and encouragement of new treatment and recycling technologies.***

The public authorities shall, within their respective powers:

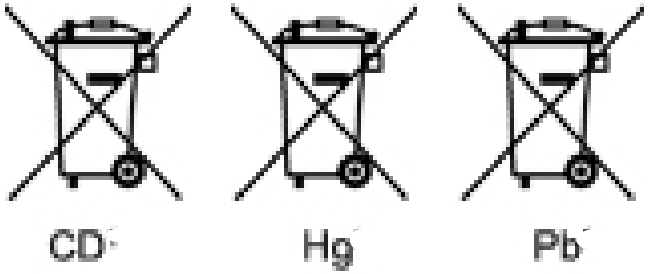
a) **promote research and encourage improvements** in the environmental performance of batteries, accumulators and battery packs throughout their entire life cycle as well as the development and marketing of batteries, accumulators and battery packs which contain smaller quantities of dangerous substances or which contain **less polluting substances, in particular as substitutes for mercury, cadmium and lead;**

Mercury related issues in the RD 106/2008(III)

Targets and management control

Article 15. *Environmental collection targets*.

3. Batteries, accumulators and button cells **containing more than 0.0005% mercury**, more than 0.002% cadmium or more than 0.004% lead **shall be marked**, under the conditions laid down in Annex II, with the chemical symbol for the metal concerned: Hg, Cd or Pb. These symbols shall also appear on the guarantee certificate and in the user instructions for appliances incorporating batteries or accumulators.



Mercury related issues in the RD 106/2008(IV)

Second additional provision. ***Disposal of portable batteries and accumulators containing mercury, cadmium or lead.***

By order of the Environment Ministry, subject to agreement by the Environment Council, the disposal in hazardous waste landfills or in underground stores of portable batteries and accumulators containing mercury, cadmium or lead which have been collected may be authorised in any of the following cases:

a) where the producers provide documentary evidence proving that **there is no viable end market for the materials resulting from their treatment and recycling**;
b) where this measure **forms part of a national strategy** for the disposal and removal of heavy metals, based on environment impact, financial and social assessments proving that the disposal option is preferable to recycling.

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Ecopilas Foundation

- ✓ *Presentation of Ecopilas Foundation*
- ✓ *Collection and treatment information*

Presentation of ECOPILAS Foundation

- Ecopilas is a **non-for-profit organization**
- Was created back in 2000

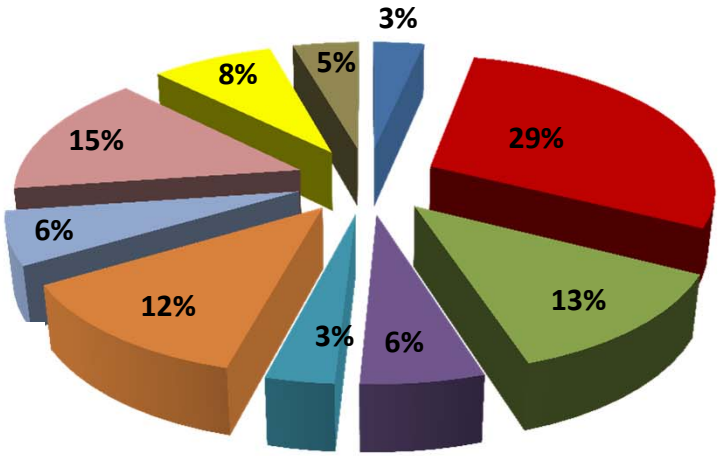
The founders of ECOPILAS are the main batteries manufacturers, representing more than 70% of all batteries placed in the Spanish market.

Energizer · Cegasa · Philips
Sony · Kodak · Anged (retailers) · former ASIMELEC

- ECOPILAS started its operations as a batteries compliance scheme back in September 2008.

Today´s represented sectors in ECOPILAS
% of number of member companies

- RETAILERS
- ELECTRONICS/ IT EQUIPMENT
- SANITARY EQUIPMENT
- GAME AND SPORTIVE EQUIPMENT
- OFICCE EQUIPMENT
- OTHER SECTORS
- SMALL HOUSEHOLD APP/ POWER TOOLS
- BATTERIES AND ACCUMULATORS
- INDUSTRIAL SECTOR
- TELECOM AND RADIOCOMMUNICATIONS

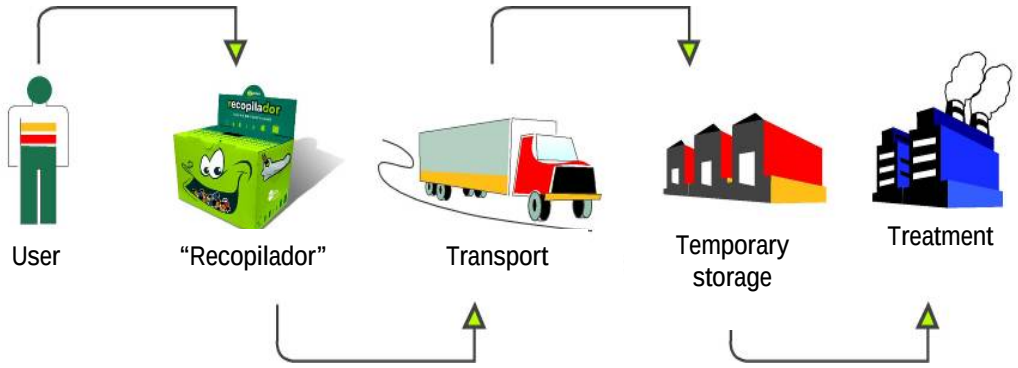


Collection and treatment of spent batteries

- ECOPILAS ensures an adequate collection and treatment of all batteries.

- ECOPILAS collects spent batteries from:
  - Retailers (big retailers and shops)
  - Municipal facilities (Clean Points)
  - Direct collection (other compliance schemes and industrial collections)

- More than 18.000 collection points by the end of 2012.



- ECOPILAS offers its member companies its logistic model and its web-based platform to request collection services.

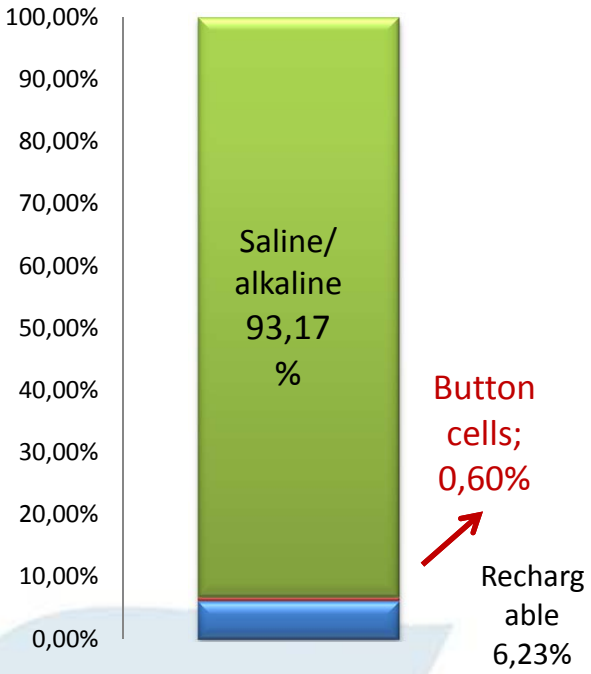
Collection flows: attending type of waste, origin and container.

Consumer Network:
- Retailers
- Public institutions

Professional Users

Industrial Sector (Mainly industrial Ni.Cd)

Some Data about ECOPILAS Portable Collections



Batteries mix composition

Through the portable flow batteries are collected in a "mix". Analysing this mix composition the 93 % of batteries wasted are saline/ alkaline batteries. This proportion increases to 97,5% if we study only the B2C flow.

Volumes

In 2011 more than 9.000 collection orders where attended, what means around 380 per week.

- *2.631 tons of Portable batteries collected in 2011*
- *34% of the batteries placed on the market.*

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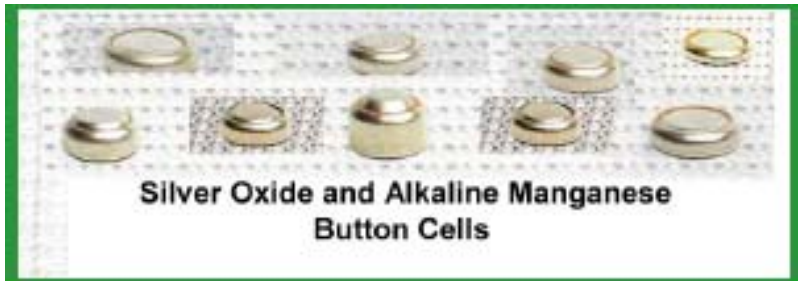
Batteries containing mercury

- ✓ *Button Cells containing Mercury in the Market*
- ✓ *Treatment process of wasted batteries*
- ✓ *European figures from European Portable Battery Association EPBA-Sustainability Report 2011*
- ✓ *Evolution of mercury contained in used batteries*

Button Cells containing Hg

I. Silver Oxide



Hg – 0,4%;

Typical Applications: Watches

Nominal Voltage: 1.5V

Recycling Technology

Can be recycled in **specialist facilities** that capture the mercury, recover the silver and produce a slag containing a mixture of metals. However in order to take advantage of this technology silver oxide button cells have to be collected separately from other button batteries. **It is not generally possible to separate them automatically from a mixture of button cells.**

Source: EPBA Tecgnical Report- Product Information Primary and Rechargeable Batteries

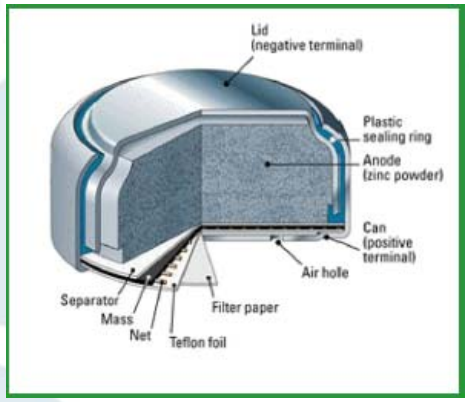
Button Cells containing Hg (II)

II. Alkaline Manganese Dioxide

Hg: 0,6 %
Nominal Voltage: 1.5V
Typical Applications: calculators, small electronic devices, remote controls.

Recycling Technology
Can be recycled in specialist facilities that capture the mercury and produce a slag containing a mixture of metals.

III. Zinc Air



Hg: 1%
Nominal voltage: 1.4V
Applications: Hearing aids, pagers.

Recycling Technology
Can be recycled in specialist facilities that capture the mercury and produce a slag containing a mixture of metals.

Source: EPBA Tecgnical Report- Product Information Primary and Rechargeable Batteries

Treatment and Recycling Process

Primary Batteries (saline/ alkaline) can be recycled through two different Technologies:

- Hydrometalurgic
- Pyrometalurgic , normally in a Waelz Kiln (most popular)

In both cases batteries are first shredded in a closed environment and the steel part (carcase) is recovered.

Then the “black mass” containing the metals is treated, in most cases in a Waelz kiln to recover the zinc.

Waelz Kiln in Asua-Bilbao

Treatment and Recycling Process

Button Cells are recycled through a distillation process in a closed environment.
Button cells are introduced in a distiller- furnice, which works as a vacuum to avoid mercury gases from escaping.

The process lasts about 24/27 hours and reaches 700 ºC

Products obtained:

Mercury 96% purity: Minas de Almaden

Steel/ Silver: further treatment in a steelwork

Water containing Hg: further treatment in as specialized treatment facility.

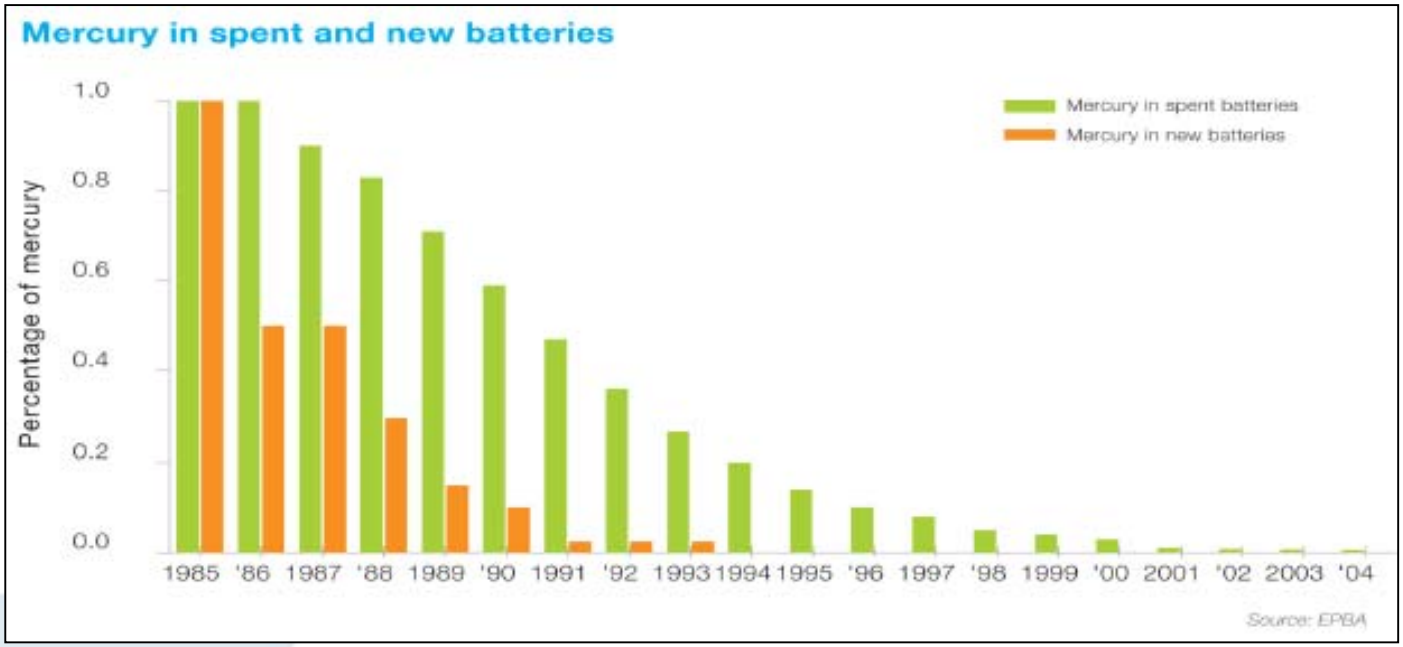
Treatment and Recycling Facilities

At the begining of this year 2012, ECOPILAS Foundation has carried out a tender for the contracting of wasted batteries treatment facilities. The duration of this contract is 3 years, until February 2015.

Both Recypilas (Vasc Country) and UTE Vilomara (Cataluña) have the shredder facility for the alkaline batteris and the distiller for the button cells.

Recyberica (Madrid) and Recilec (Andalucía) are only sorting plants.

European Portable Batteries Asociation (EPBA) Sustainability Report 2011



Decline in Mercury levels

The industry has developed Mercury-free technologies for button cells.

The market uptake of these Hg-free technologies has been slow due to external factors:

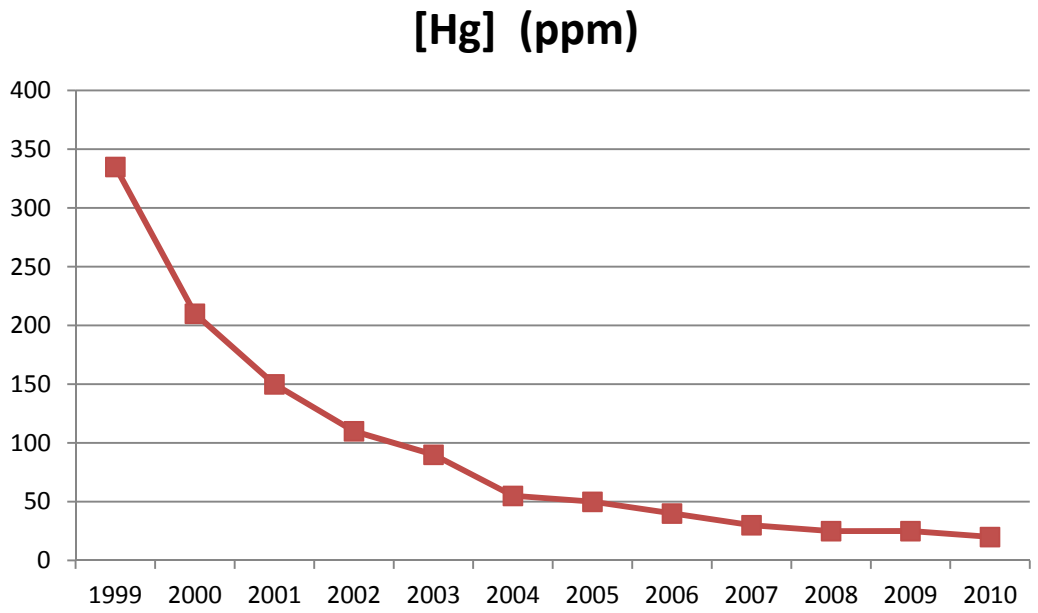
- Commercial pressures from bulk buyers of button cell batteries
- High manufacturing costs: 10% premium compared to mercury containing button cells

www.epbaeurope.net/Sustainabilityreport.htm

Evolution of presence of Hg in ppm in saline/ alkaline batteries

Evolution of the average content in mercury (ppm) in the black mass (saline/alkaline mix already shreddered) – **UTE VILOMARA**

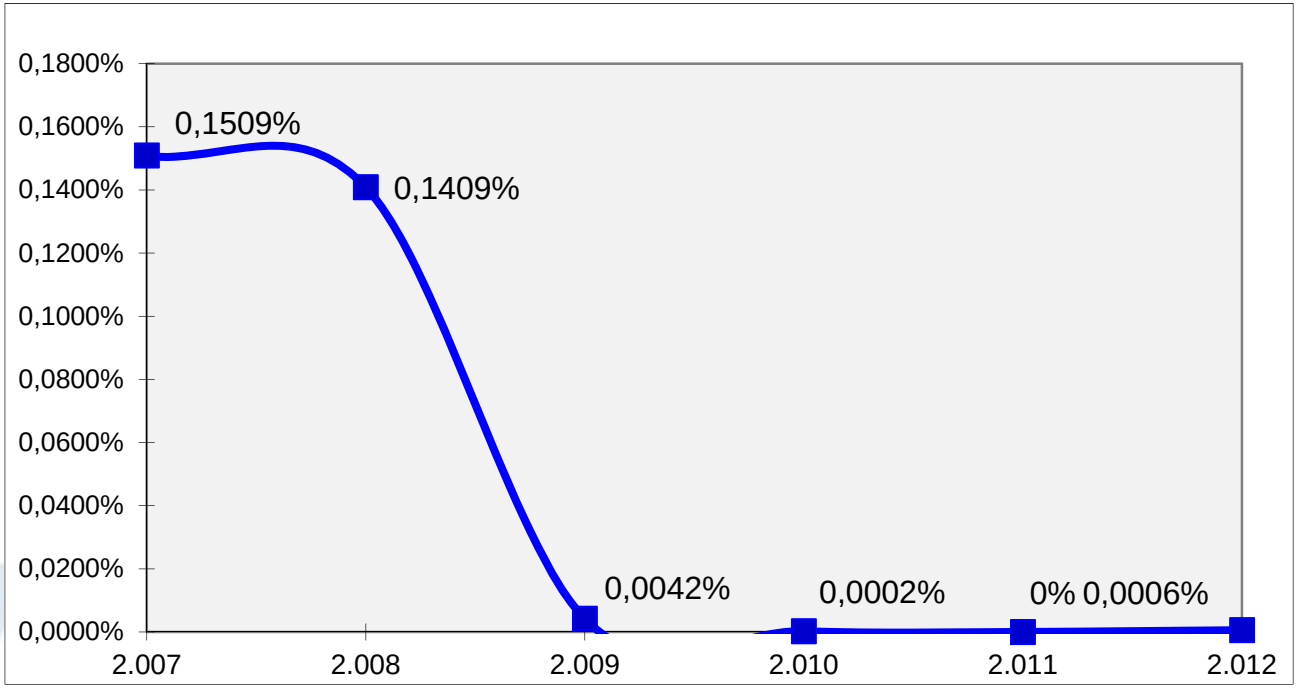
YEAR	[Hg] (ppm)
1999	335
2000	210
2001	150
2002	110
2003	90
2004	55
2005	50
2006	40
2007	30
2008	25
2009	25
2010	20



Data provided by UTE Vilomara

Evolution of % saline/ alkaline batteries with high content* of Hg.

Evolution % saline/ alkaline wasted batteries with high content* of mercury in the "battery mix"-
Recypilas facilities



*High content considering more than 15 ppm of Hg

Data provided by Recypilas S.A.

YEAR	2.007	2.008	2.009	2.010	2.011	2.012
Total Mix (Kgs)	1.158.417	960.567	1.890.915	2.887.330	3.359.614	5.336.423
Hg containing bat.(Kgs)	1.748	1.353	79	6	0	30
% of Hg containing bat.	0,1509%	0,1409%	0,0042%	0,0002%	0%	0,0006%

Some examples of batteries containing Hg

Saline Battery R6
Brand: Xingpai
Tamaño: R6
Origin: Asia

Hg content. : 134 p.p.m.

Alkaline Battery R6
Brand: Panashiba
Origin: Asia

Hg. Content: 1998 p.p.m.

Brand : Enercell
Origin Unknown

Hg Content.: 280 p.p.m.

All those batteries are nowadays illegal and cannot be commercialized in Europe

Source: Recypilas S.A.

Thank you very much for your attention

Te esperamos en

www.ecopilas.es

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