



Position Paper

Collection Target for Waste Batteries

1. Eucobat position

A collection target can only be adequate if it is related to the quantities of waste available for collection.

Only this way, it allows to measure the performance and the effectivity of the collection scheme.

Based upon the quantities of batteries put on the market, and the known lifespan of the different types of batteries, the batteries that are “end-of-life” can be calculated.

Taking into account the quantities of exported second hand or waste electrical appliances, the quantities of batteries “available-for-collection” can be rated.

An extensive European study on the lifespan of batteries indicates that the quantities of batteries “end-of-life” can be rated at approximately 80% of the batteries put on the market.

The ProSUM study, ordered by the European Commission concludes that at least 45.000 tonnes, or 19% of the batteries “end-of-life” are exported from the EU, incorporated in a second hand or waste electrical appliance, and are thus not available for collection in the European Union. In other words, only 80% of the batteries “end-of-life” are available for collection.

As a consequence, Eucobat proposes to define the collection target in function of the quantities of “batteries available-for-collection”, rated at 65% of the batteries “put-on-the-market” (80% * 80%).

2. The Batteries Directive

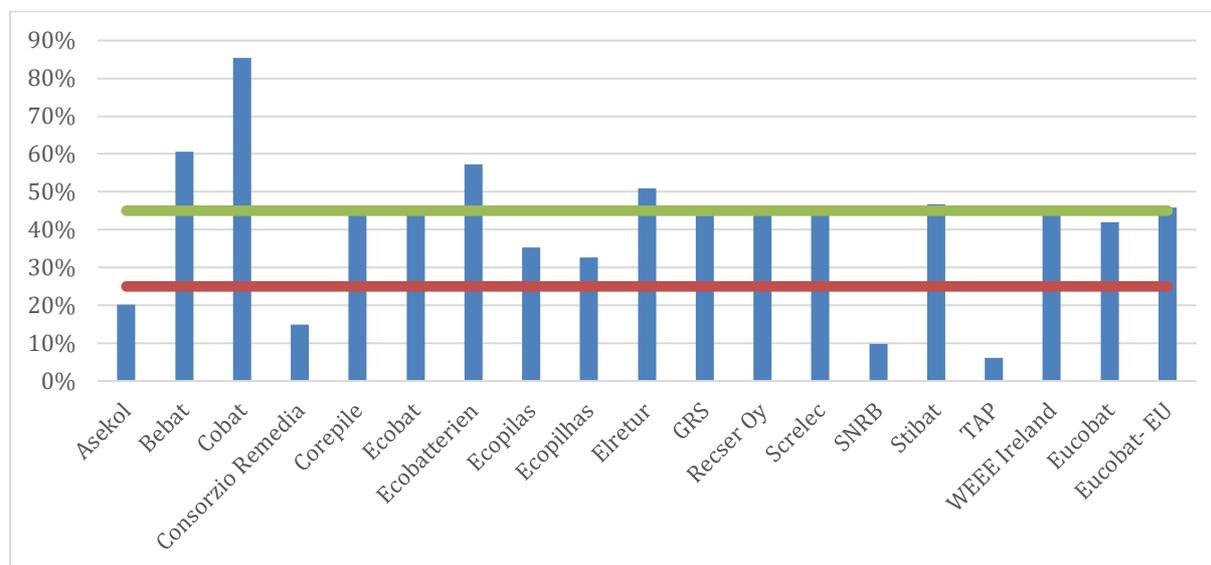
The actual Batteries Directive¹ defines the ‘collection rate’ as the percentage obtained by dividing the weight of waste portable batteries and accumulators collected in a calendar year by the average weight of portable batteries and accumulators put on the market during that calendar year and the preceding two calendar years.

According to the directive, Member States have to achieve the following minimum collection rates:

- (a) 25 % by 26 September 2012;
- (b) 45 % by 26 September 2016.

¹ 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 and repealing Directive 91/157/EEC

These targets prove to be challenging, even for mature schemes (Figures: EucoBAT 2017).



3. Inadequacy of the current collection target

The concept of a collection target for the waste volume in relation to the volume placed on the market is not appropriate for (waste) batteries. In most cases, there is no correlation between the quantities of batteries recently put on the market and waste batteries that are available for collection. Most batteries are not available for collection within three years of the date they've been put on the market.

The main reasons for this are the evolution of the battery market and the lifespan of the batteries.

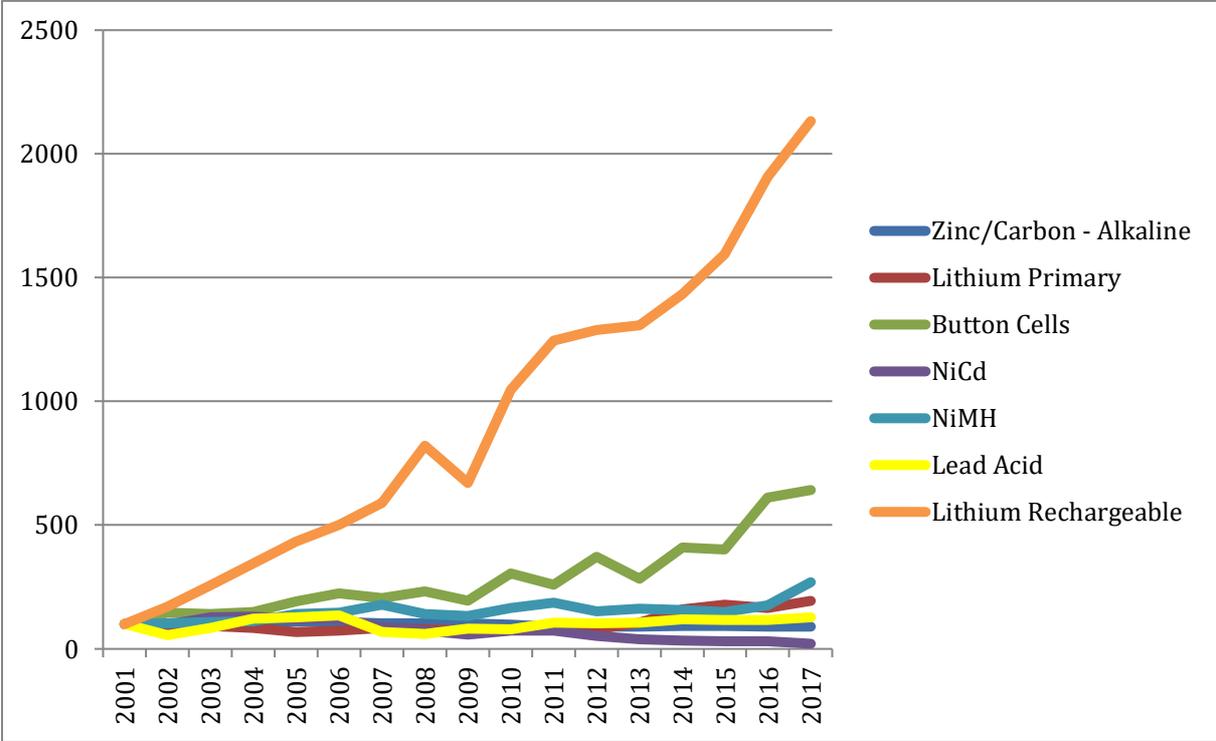
a. Evolution of the battery market

Since 2001, the number of rechargeable lithium batteries put on the market increased steadily and more than significantly.

The impact on the collection rate increases each year.

While the weight of alkaline / zinc carbon batteries put on the market has decreased with 10% between 2001 and 2017, the weight of rechargeable lithium batteries put on the market has been multiplied by 21 during the same period, as shown in the graph below.

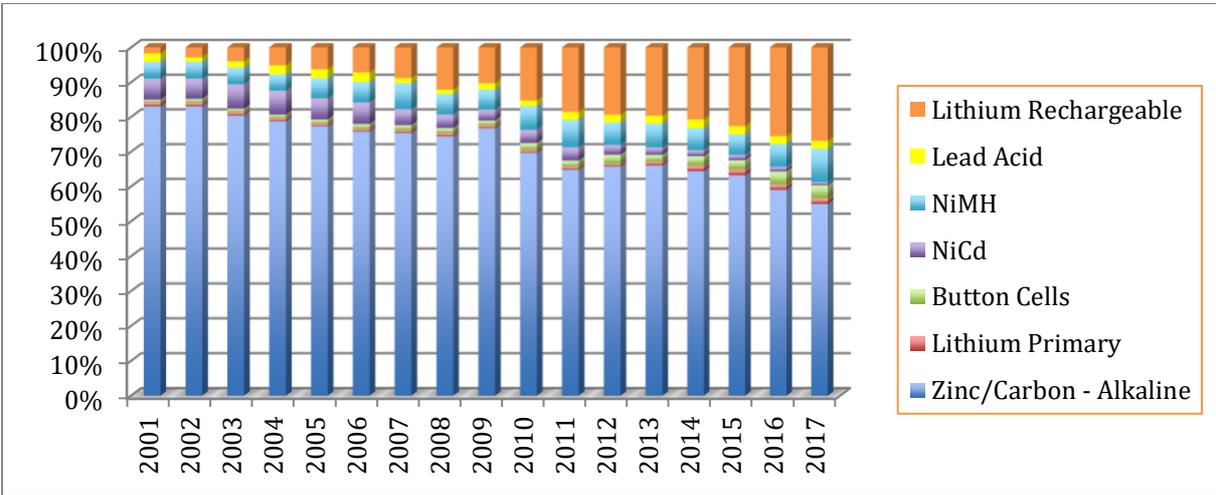
Batteries put on the market per chemistry (Figures Eucobat - 2001=100)



There are no indications that this market trend would change in the near future.

As a consequence, the market share of the rechargeable lithium batteries in the total battery mix has increased dramatically.

Evolution Portable Battery Mix POM (Figures Eucobat)



b. Lifespan of the batteries and availability for collection

The lifespan of batteries is in many cases much longer than three years, so there is no strong correlation between batteries recently put on the market and the waste batteries collected.

This lack of correlation is most evident for the rechargeable batteries. Their lifespan is significant longer than three years, in particular for the newer chemistries with high energy density, mainly used in cordless power tools, laptops and cell phones.

Not only the technical lifespan of these rechargeable batteries is much longer than 3 years, consumers tend to keep them with the connected appliance even after the appliance has been replaced (hoarding effect).

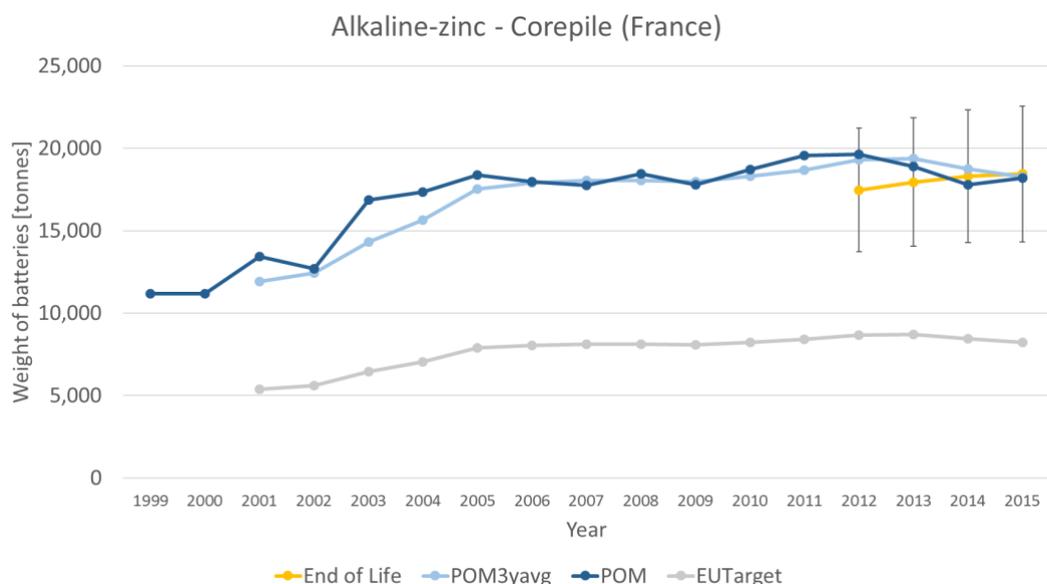
To a certain extent, the same reasoning is valid for the primary batteries.

Thanks to the growing capacity of the batteries put on the market and the increasing energy efficiency of the appliances they are used in, the technical lifespan of the primary batteries is rising each year, and in more and more cases exceeding the three-year period.

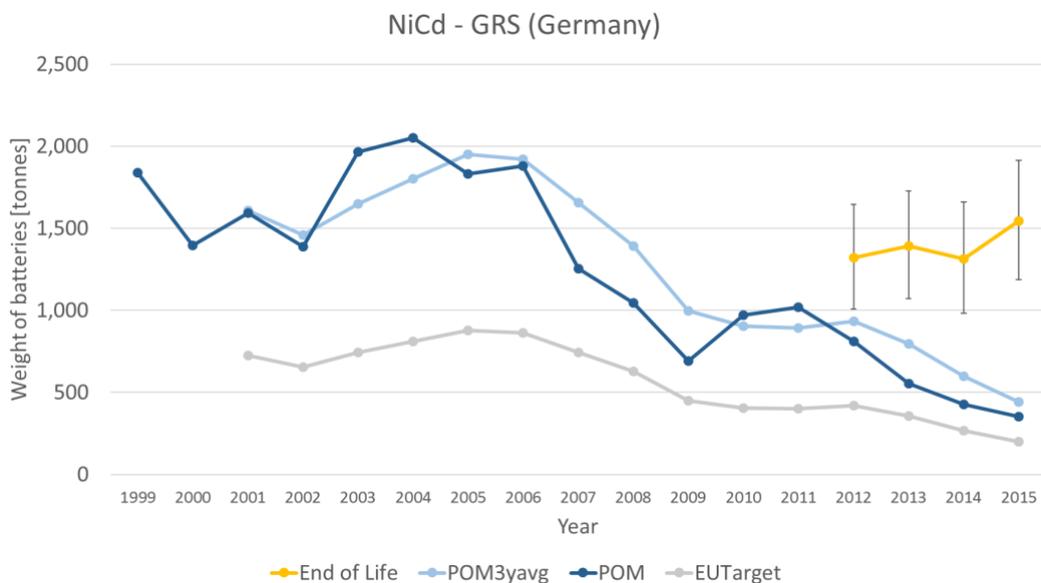
Furthermore, given the extension of the expiration date of the batteries (up to 7 years), an important part of the batteries remain in the drawer for a long time before they are effectively used.

Based upon an extensive study on the lifespan of batteries, one can conclude that:

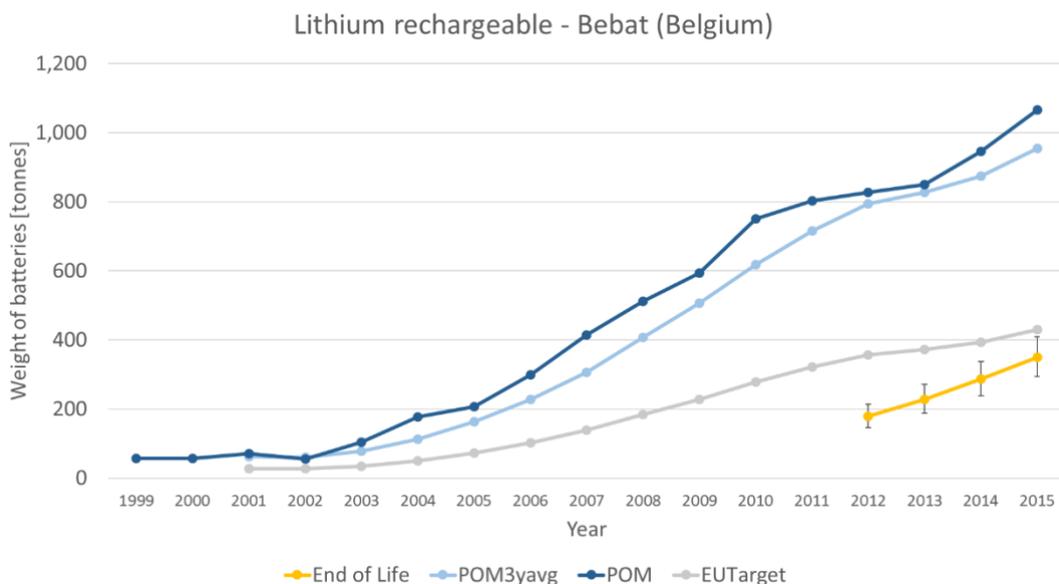
- If the weight of batteries **put on market (POM) is stable**, the average POM during the last three years is very similar to the amount of batteries at the end of life (with the 3-year average deviating at most 13% from the end of life batteries).



- If the weight of batteries **put on market (POM) decreases**, the average POM during the last three years is on average about 40% lower than the amount of batteries at the end of life.



- If the weight of batteries **put on market (POM) increases**, the average POM during the last three years is on average about 50% higher than the amount of batteries at the end of life.



4. EucoBAT Position

A collection target can only be adequate if it is related to the quantities of waste available for collection.

Based upon the quantities of batteries put on the market, and the known lifespan of the different types of batteries, the batteries that are “end-of-life” can be calculated easily.

Taking into account the quantities of exported second hand or waste electrical appliances, the quantities of batteries “available-for-collection” can be rated.

An extensive European study on the lifespan of batteries indicates that the quantities of batteries “end-of-life” can be rated at approximately 80% of the batteries put on the market.

The ProSUM study, ordered by the European Commission concludes that at least 45.000 tonnes, or 19% of the batteries “end-of-life” are exported from the EU, incorporated in a second hand or waste electrical appliance, and are thus not available for collection in the European Union. In other words, only 80% of the batteries “end-of-life” are available for collection.

As a consequence, EucoBAT proposes to define the collection target in function of the quantities of “batteries available-for-collection”, rated at 65% of the batteries “put-on-the-market” (80% * 80%).

This concept has already been integrated in the new WEEE Directive, where a methodology for calculating collection rates based on WEEE generated should be developed in the near future.

This methodology allows taking into account the differing life cycles of the batteries and of the appliances they are used in, as well as the market situation and saturation.

It requires however the obligation for all actors to report to the national authorities and the obligation for the member states to monitor all waste streams.

The producers remain responsible for accepting all waste batteries handed over to them.

5. Elements influencing the collection rate

When defining a collection target, one should take into account several elements that influence the collection rate:

- Lifespan of batteries
- WEEE collection rate
- Removal of batteries from WEEE
- Impact of competition
- Interpretation of definitions
- General consumer awareness towards waste
- Density of the collection network
- Intensive consumer awareness campaigns

a. Lifespan of the batteries and evolution of the battery market

It is evident that the lifespan of the batteries and the evolution of the battery market are the main elements influencing the collection rate if the collection target is not defined in function of the batteries available for collection, as explained above.

b. WEEE collection rate

Many batteries are discarded together with the appliance they were used in.

The batteries can mainly be found in ICT equipment (laptops, cell phones, ...), consumer electronics and power tools.

These are also the WEEE categories with the lowest collection rates implying that there are but few batteries that may be collected from this waste stream.

While generally for the members of Eucobat, the batteries put on the market integrated in an appliance represent 20 - 35% of the total amount of batteries put on the market, the batteries collected from the WEEE dismantlers generally only represent 4 - 13% of the total amount of collected batteries.

c. Removal of batteries from WEEE

According to Article 8.2 and Annex VII of the WEEE Directive², proper treatment of waste electrical and electronic equipment (WEEE) includes the removal of batteries from any separately collected WEEE.

As stipulated in Article 3.1.1 of the WEEE Directive, 'removal' means manual, mechanical, chemical or metallurgic handling with the result that hazardous substances, mixtures and components are contained in an identifiable stream or are an identifiable part of a stream within the treatment process. A substance, mixture or component is identifiable if it can be monitored to verify environmentally safe treatment.

The European standard EN 50625-1³ stipulates that batteries that are accessible in the equipment without using tools should be removed from WEEE before any treatment process that can cause damage to them. Batteries that are not accessible in the equipment without using tools should be (part of) an identifiable stream.

Special precautions and safety measures should be in place for the treatment of WEEE, which may contain lithium batteries and for operations involving used lithium batteries, and for fractions containing lithium batteries.

Lithium batteries should be protected to prevent exposure to excessive heat, water, or any crushing or physical damage during handling, sorting, and storage.

² Directive 2012/19/EU of The European Parliament and of the Council of 4 July 2012 on Waste Electrical And Electronic Equipment (WEEE)

³ Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements

Article 11 of the Battery Directive⁴ stipulates that appliances should be designed in such a way that waste batteries and accumulators can be readily removed.

However, while the original Battery Directive indicated that the batteries should be removable by the end-user, the new amendment of the Battery Directive stipulates that, where they cannot be readily removed by the end-user, waste batteries and accumulators should be readily removable by qualified professionals that are independent of the manufacturer, such as independent repair and service centers and WEEE dismantlers.

Appliances in which batteries and accumulators are incorporated should be accompanied by instructions on how those batteries and accumulators can be safely removed by either the end-user or by independent qualified professionals. Where appropriate, the instructions should also inform the end-user of the types of battery or accumulator incorporated into the appliance. These provisions do not apply where, for safety, performance, medical or data integrity reasons, continuity of power supply is necessary and a permanent connection between the appliance and the battery or accumulator is required.

The combination of the above-mentioned provisions that

- batteries should only be removable by qualified professionals, thus allowing the mandatory use of a (specific) tool (Battery Directive),
- only those batteries that can be removed without using a tool should be removed from the appliances (European standard EN 50625-1),

implies that a substantial part of the batteries from WEEE won't be removed.

Given the quantities of batteries incorporated in appliances, this has a serious impact on the collection rate for batteries.

d. The impact of competition

There is a correlation between the number of compliance schemes in a member state and the achieved collection rate, as shown by the following graphic:

Eucobat fully adheres to the principles of free and fair competition, but a higher number of collection schemes increases the risk of unfair competition.

A level playing field with uniform standards for all actors is required to ensure fair competition. There is a need for a control mechanism to guarantee that all discarded batteries, including the negative value stream, are collected and that cherry picking is avoided.

The efforts of competing schemes to collect the batteries at the lowest costs, and the focus on high performing collection points prevents the nationwide service for all collection points, e.g. in poorer populated regions.

A nationwide coordination is required in order to optimize the effectiveness of consumer awareness measures and the provision of sufficient collection points for users, and to ensure the take-back of waste batteries from all entities that collect them without distorting the competition between the schemes.

⁴ Directive 2006/66/EC of 6 September 2006 of the European Parliament and of the Council on batteries and accumulators and waste batteries and accumulators

e. Interpretation of definitions

The producers can easily apply the definitions of the current Batteries Directive, as they know in most cases the intended use of the batteries they put on the market, which is one of the criteria of these definitions.

It is however much more difficult for the operational actors to apply these definitions, as they only receive the batteries and battery packs, without knowing the applications they were used in. They are obliged to use a set of criteria that differs from country to country.

The different interpretations in the Member States have a serious impact on the reported collection rates. As a consequence, these differences make it very difficult to compare the figures of the Member States.

f. General consumer awareness towards waste

There is a strong relation between the general consumer awareness towards waste and the battery collection rate.

The member states where the consumer awareness and attitude towards selective collection of specific waste streams is high, are also the countries where the compliance schemes achieve the highest collection rates for batteries.

g. Density of the collection network

A minimum density of the collection network is required to ensure effective collection, but:

- there is not necessarily a direct correlation between the achieved collection rate and the number of collection points;
- once the optimal density has been reached, additional collection points will not lead to an increase of the collected quantities, due to the substitution effect;
- the size, the quantity and the dispersity of the collection points influence the covered transport distances, the carbon footprint of the logistic scheme and the related costs.

Distributors have an important role in contributing to the success of the collection.

They should provide for the collection, at retail shops or in their immediate proximity free of charge to end-users and with no obligation to buy a new battery, unless an assessment shows that alternative existing collection schemes are likely to be at least as effective.

Consumers have to actively contribute to the success of such collection and should be encouraged to return waste batteries. The visibility and accessibility of the receptacles are essential to achieve a high level of convenience.

It is not feasible to develop a common model for all countries, as there are substantial differences that influence significantly the required density of the collection network, such as :

- demographical and geographical characteristics: the population density, the surface, the urbanization degree have a large impact on the required network;
- existing public and private (good working) collection infrastructure and systems for waste collection;
- quality of the collection points: while the quantity of collection points matters, the quality is even more important; it is crucial to be present at locations with a lot of regular visitors (that are well informed where they can discard their used batteries) and with a high visibility of the receptacles;
- general consumer awareness concerning waste;
- single or multiple compliance organizations in one country.: in case of multiple compliance organizations, the efforts of competing schemes to collect the batteries at the lowest costs, and the focus on high performing collection points prevents the nationwide service for all collection points, e.g. in poorer populated regions.

As a conclusion, Eucobat esteems that a minimum density of the collection network is a precondition to ensure effective collection. However, the minimum density cannot be determined in a general way for all countries, as substantial differences influence significantly the collection rate and the required density.

h. Intensive consumer awareness campaigns

Consumers and other end-users play an important role in the collection schemes for batteries. It is therefore of the utmost importance that they are fully informed on the desirability of separate collection and the available collection schemes.

However, it is not feasible to define the requirements for consumer awareness campaigns in a harmonized way for all countries, as there are substantial differences between them. The required intensity of the specific awareness campaigns for the selective collection of waste batteries depends for a large part on the existing collection infrastructure for waste in general or for other specific waste streams, the awareness of the end-users concerning this infrastructure and the existing practices and attitude of the end-users related to waste and sorting for selective collection. The historical evolution in this field should be taken into account, as well as the national requirements.

The end-user must be informed of the advisability of the selective collection of waste batteries and where he can find a nearby collection point. The content, the format and the size of the consumer awareness campaigns must be adapted to take into account all these elements and the national cultural sensitivities.

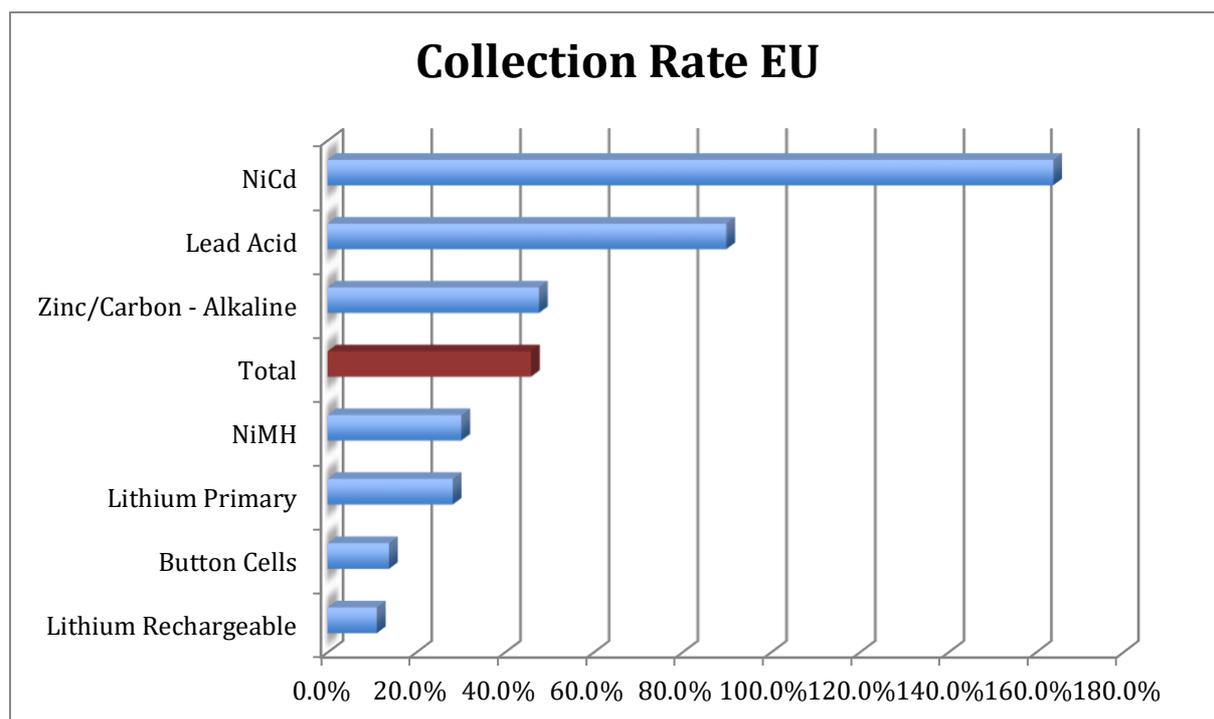
The financial and economical impact of the consumer awareness campaigns for the battery producers must also be taken into account, as the cost for the marginal increase of the consumer awareness might be excessive.

In case of multiple compliance organizations in one country, a nationwide coordination is required in order to optimize the effectiveness of consumer awareness measures, without distorting the competition between the schemes.

6. Collection rate per chemistry

Due to the elements cited before, the collection rate for rechargeable lithium batteries is much lower than for the other chemistries. The increasing market of rechargeable batteries leads to an overall lower collection rate and a decreasing potential of batteries available for collection.

Collection rate per chemistry (Figures Eucobat 2017)



7. About Eucobat

Eucobat aisbl is the European association of national collection schemes for batteries. They assure that all waste batteries are collected and recycled in an ecological sound way, and contribute this way to a better environment.

Eucobat aisbl
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