Survey Report 10

Bebat
(Battery Recycling Company)

Bebat

Contact person: Mr. Peter Coonen（Managing Director）
Ms. Nele Peeters（Director Marketing, Operations and Innovation）
Visiting location: Tienen, Belgium

Company profile

- **A system is in place to collect and recycle batteries safely and efficiently in order to protect the environment.**
- **Around 5 000 companies participate in Bebat's battery collection and recycling project.**
- **Bebat has set up around 25,000 collection points and collects 3,907 tonnes of batteries per year in order to contribute to the environment. It collects more than 90% of all collectable batteries.**
- **There is a strict rule in Europe that 'battery distributors must pay the cost of recycling', and Bebat works with car dealers and other companies from a variety of industries.**

Battery collection system

- **There is one collection point every 400 m and per 500 inhabitants.**
- **Consumers can bring in any small battery free of charge.**
- **The European Government has passed new battery regulations, which allow consumers to bring in large batteries free of charge.**

Battery collection system

- **'Technical Commercial Advisors' are deployed at collection points to remind people to co-operate with safe battery collection and to respond to collection points' questions about battery collection.**
- **Paper boxes (approximately 8 cm square) are distributed to each household, and batteries of a size that can fit into these boxes are put into containers installed at schools and retailers, while batteries of a size that cannot fit into the boxes are taken to municipal recycling centers.**

Collection container

- **The collection containers are fitted with fill rate sensors which automatically inform Bebat when the container is full.**
- **Temperature sensors give a local alarm and inform Bebat in case of fire.**
- **Collection containers vary between retail outlets, schools and recycling centers. The fill rate is communicated via the SIM card provided.**
- **The fire prevention boxes are patented and exported in Europe and to the US, Canada and Australia.**

Fire prevention box

Sorting line

- **Sorting is carried out by means of pre-treatment, manual sorting and mechanical sorting.**
- **An AI-equipped X-ray sorting system will be installed in 2024-2025. This will separate primary and secondary batteries and sort out those containing high levels of rare metals, such as nickel, to increase the recovery rate of rare metals.**

Sorting line

- **Battery storage and sorting operations have a high risk of fire, so short sorting times and temperature control are important. In case of fire, water storage containers have been installed to extinguish fires. There is also a move to consider fire prevention design at the battery production stage.**
- **Collection containers are contaminated with household waste such as plastic bottles, jars and cans other than batteries. Liquor and cigarettes are sometimes mixed in.**

Sorting line
(mechanical sorting by sieve vibration)

Sorting line (small batteries after sorting, contaminants other than batteries)

Sorting line (small batteries after sorting, lamps mixed in collection containers)

EV battery recycling

- **EV batteries are highly dangerous if not dismantled according to procedure. Conventional batteries can be handled due to experience, but batteries containing lithium are difficult to handle.**
- **30,000-50,000 t of EV batteries are disposed of in Europe every year, which is expected to rise to 600,000 t by 2030.**

EV battery recycling

- **A company specializing in EV battery collection has been established to centrally manage information on EV batteries, so that the system can identify where waste batteries can be brought to.**
- **Lack of recycling capacity. In particular, there is no participation of Japanese manufacturers.**
- **The new lithium batteries contain LFP (lithium iron phosphate), which is not yet addressed by the Belgian national or European recyclers.**

Battery passport

- **The battery passport is very positive about its operation, but progress is slow because it is not top-down from the government and requires coordination with various organizations.**
- **It is important to ID the battery and the following benefits (next slide) can be derived from the passport information.**

Battery passport

- **If the origin of who manufactured and sold the batteries is known, it is possible to identify who should be charged for the collection and disposal of the batteries. If the origin is not known, it is difficult to identify the party to be charged for the costs.**
- **Knowing the substances contained from passport information will help to identify precautions to be taken when recycling, and contribute to improved safety in battery collection and sorting operations. It may also change recycling methods and disposal costs.**
- **Tracing battery information enables usable batteries to be identified and reused.**

Energy storage system batteries (ESS) for solar energy

In Belgium, fees are paid when purchasing ESS batteries and serial numbers are registered. After 15 years, the process is checked to ensure that the fees have been paid.

E-bike battery

Bicycle batteries are usually 40% reusable. Currently, 70-80% are not reused.

Environmental education

- **A factory tour facility, 'Villa Pila' has been set up to provide environmental education, including recycling, for children aged 9-12.**
- **Collecting batteries at school earns points, which can be used to help pay for playground equipment and field trips.**
- **Workshops for school personnel and children are also actively conducted.**

Battery exhibit