Europe's circular economy leaders demand removable, replaceable and repairable batteries.

Actors already building a circular economy for batteries in Europe, i.e. repairers, refurbishers and recyclers, alongside environmental NGOs, call on the European Commission, Parliament and Council to adopt ambitious requirements in the Battery Regulation to enable battery removal, replacement and repair for consumer electronics and LEVs.

Removable, replaceable and repairable batteries are an essential element of the battery regulation in order to support value retention and circularity, reduce EU dependency on critical raw materials, reduce e-waste and unnecessary consumption, as well as supporting worker safety and fire prevention.

Non-removable batteries and battery repair

In 2015, at least 60% of portable electronics used lithium-ion batteries (LIBs) - the fastest growing battery technology on the market. LIBs depend on increasingly scarce, finite and largely imported minerals such as lithium and cobalt, require intensive production processes, and the use of toxic fluorinated compounds.

Non-removable batteries are widespread in portable electronics today. It is estimated that between **90-100% of smartphones, tablets, laptops, headphones and smartwatches include integrated batteries**. Integrated means that rather than having modular designs which make them easy to remove, they are glued or soldered in place, requiring specialist tools, time and knowledge to remove them without damaging the device or the battery itself. **The market for integrated batteries is expected to double by 2030.**

Non-removable/-replaceable batteries can lead to shorter product lifetimes - notably when they are difficult to remove, the risk of damaging the device is high, or there are barriers to accessing spare batteries, tools or relevant information. Similarly, difficulty in accessing batteries or cells in a battery pack can result in their unnecessary disposal. Many battery packs are disposed of even so they contain cells which could be repurposed. Light means of transport such as e-scooters and e-bikes increasingly have removable and replaceable battery pack designs. However, the battery packs are usually designed in a way making battery repair, such as the replacement of cells, difficult or dangerous. Battery manufacturers increasingly also use software to prevent battery pack repair. There is an emerging market of battery repairers in Europe, notably in countries with high e-bike use such as the Netherlands, Belgium and Germany. **In cases where spare battery packs are not available or battery repair is prevented by manufacturers, entire bikes are being unnecessarily disposed of.**

Recycling, fires and worker safety

Non-removable batteries pose a major barrier to effective battery recycling, and fires from damaged batteries threaten worker safety as well as the economic viability of facilities. Standard practices for including batteries in products often greatly reduces the recyclability or repairability of the device itself.

Time and tools required to remove batteries reduce the likelihood that consumers will remove batteries from devices before disposal, similarly they will increase the operational costs for sorting facilities - who themselves are unlikely to have specialist tools necessary to manually remove adhesives or proprietary connectors. Integrated batteries also make it more difficult to identify whether a device contains a battery at all.

Resultingly **the number of rechargeable LIBs which are collected in the EU remains low**. In addition to low recovery rates, WEEE management facilities also report an increasing number of fires. Noteworthy to mention is that battery fires are not only a problem faced by facilities managing WEEE containing batteries but also by the whole recycling industry at large. For instance, non-removable batteries are also encountered in other products (e.g., apparel, paper products, etc.) that very often end up in the wrong waste stream causing thermal events. **Between 50-95% of fires in recycling facilities can be attributed to damaged batteries.** Fires can damage or destroy facilities, the **average cost of severe incidents is estimated at between 190,000 and 1.3 million EUR**. Finally, the steady increase of thermal events caused by LIBS is affecting the policies of insurance companies which is seen as a huge bottleneck by waste operators especially since the activity permit to operate is conditioned to obtaining insurance coverage.

Policy recommendations

We call upon policy makers to set ambitious removability, replaceability and repairability requirements in Article 11 of the battery regulation:

Scope*: the scope for these removability requirements should cover all consumer electronics. Light means of transport (e.g. e-bikes and e-scooters) should also be included in the scope.*

Removal and replacement for all*: battery removal and replacement should be enabled for both independent professionals and end users. Enabling removal and replacement by citizens is essential for battery recovery and extending the life of electronics. Battery removal should be possible with no tools at all, or commonly available tools (i.e. with respect to EN 45554:2020).*

Battery repair and repurposing for professional repairers*: as well as removability and replaceability, battery repair should be enabled for independent professionals. The Commission is encouraged to start a standardisation process for cell level repair and repurposing.*

Batteries as spare parts*: quality battery packs should be available to end users as spare parts for _at least_ the expected lifetime of the device. The components of the battery packs (e.g. cells, casing, board/BMS) should be available to independent professionals. Clear replacement and repair instructions should be freely available to end users and independent operators respectively to ensure safe battery management.*

Software*: battery software should not be a barrier to battery replacement or repair. Updates and serialisation should not prevent or discourage replacement by end-users, and independent operators should be able to manage the BMS to restore batteries they repair or repurpose.*

Derogations*: it is foreseeable that there are justifiable cases for exemptions for these requirements (e.g. for medical devices) however any derogation should not present a loophole for manufacturers. Overall, single use, unrecoverable applications such as "printed batteries" should be reserved for essential applications.*

Sources and further reading

[Battery Roundtable/EuRIC (July 2021) Recommendations for tackling fires caused by lithium batteries in WEEE- A report of the Batteries Roundtable](#)

[IIEEE & EEB (December 2021) Removability and replaceability of batteries in consumer electronics.](#)

Supporters: this joint statement has the support of the following organisations, including membership, this represents around 500 companies, social economy actors and NGOs who support a more circular economy for batteries:

Back Market (consumer electronic refurbishment platform, France)

Batterie Express (battery repair company, France)

DUH eV (Deutsche Umwelthilfe, NGO, Germany)

ECODES (Fundación Ecología y Desarrollo, environmental NGO, Spain)

ECOS (Environmental Coalition on Standards, representing 52 NGOs working on standards)

EEB (European Environmental Bureau, representing 180 environmental NGOs, pan European)

EERA (European Electronic Recyclers Associatation, representing 32 WEEE recycling companies, pan European)

EuRIC Aisbl (Confederation of European Recycling industries, representing 30 recycling companies, pan-European)

Germanwatch eV (sustainability NGO, Germany)

Legambiente (environmental NGO, Italy)

Liofit GmbH (Battery repair for e-bikes, Germany)

Presta-Batteries SARL (battery refurbisher, France)

Right to Repair Europe (repair campaign, representing 25 repair cafes, 30 NGOs and 20 repair businesses, pan European)

RREUSE (Network of social enterprises active in reuse, repair and recycling, representing 30 organisations, pan European)

Transport & Environment (environmental NGO focused on transport, representing 63 organisations)

Zero Waste Europe (network of zero waste pioneers and communities, representing XXX, pan-European)

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