
The Future is "Green" with Sustainable Battery Free 'Fit and Forget' Asset Tags

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Tags with batteries contain hazardous waste substances such as mercury, lead and cadmium. If they are disposed in a landfill site, they could leak into the surrounding environment. The EU Landfill Directive placed a ban on the disposal of such hazardous waste in landfill sites. Hazardous waste such as batteries is NOT allowed to be mixed up with other waste streams. It must be separated, stored safely, and collected for treatment before being disposed. Strict statutory targets for the recycling of batteries exists. The EU Batteries Directive is to minimise the negative impact of batteries and accumulators on the environment, thus contributing to the protection, preservation, and improvement of the quality of the environment.

Onerous Do's and Don'ts

Do's - Batteries should be removed from the body of the tag. If the batteries are physically damaged, they need to be stored in an insulated plastic bag to avoid short-circuiting. Ideally, they should be kept in a cool and dry place to avoid combustion. Ultimately, they need to be physically taken to a certified recycling provider who can safely deal with the hazardous materials they contain. **Don'ts** - Disposing of used batteries into your corporate recycling bin is a big NO unless its specifically allocated to battery disposal. Damaging batteries by squashing them down can result in leakage and/or short-circuiting. Storing quantities of

lithium-ion batteries close together without proper precautions in a warehouse for example can lead to fire situations. It's important not to store old batteries close to flammable materials. The only safe way to recycle li-ion batteries is to have them processed by an authorised and correctly qualified electronic recycling facility. That means looking up your nearest centre and dropping off any old tags or tag batteries if exchangeable or getting them collected by a reputable service.

In an ideal world, batteries should be accepted for correct recycling free of charge in small quantities, but larger commercial volumes may well attract a charge. The hassle of collection removal, and if appropriate battery replacement, should not be underestimated and carries a cost as well as a carbon footprint.

From an environmental sustainability angle there are other considerations

If we look at a ten-year scenario where **10,000** battery driven tags have been sold into an organisation with an assumption that these will die over a three-to-four-year period, then that means that 10,000 tags or tag batteries must be exchanged, optimistically up to three times. So, over a ten-year period that could result in **30,000 tags or tag batteries** requiring legal

disposal.

Not only does this have a cost implication, unit replacement costs, time, and effort to remove replace batteries or complete tags but other considerations are at play.

The physical delivery and disposal of tags attracts transport costs and naturally creates a carbon footprint. Most tags are sourced from the Far East, so that means a flight or ship journey. Tags have a shelf life and so fresh stock is always a requirement, therefore it is safe to assume that in our 30,000-tag scenario over ten years that would incur three separate shipments, as well as local delivery and ultimate collections all times three. Clearly however, in our scenario this is not going to destroy the planet. The issue is that the more assets that become tagged with battery driven technology to meet the requirements of the consumer, as predicted and driven by the IOT explosion, we start to see a picture where billions of tags are in service. Then that becomes a much bigger picture.



In 2018, 191 000 tonnes of portable batteries were sold in the EU; 88 000 tonnes of used portable batteries were collected as waste to be recycled. Only 48% of portable batteries sold in the EU were collected for recycling. Some countries are doing better than others with Canada reported as only achieving 5% in 2021.

The battery recycling market size is forecasted to be worth USD 24.57 Bn growing at 5.3% CAGR Till 2027; By 2030, the revenue opportunity in reusing and recycling lithium-ion batteries is expected to stand at around eight billion U.S. dollars in China alone. The market for recycled batteries is gradually growing as demand for ethical consumer electronics has emerged in countries such as the UK and Germany. As the world demand for lithium-ion batteries continues to soar, the mining industry will need to ramp up production of lithium. Recycling capabilities of lithium-ion batteries will also need to significantly increase by 2030 in order to cope.

As the recycling opportunity from a business perspective gains momentum it is anticipated that solution providers will undoubtedly be expected to address this and will be held accountable with stronger legislation evolving as more devices are battery enabled. Legislation certainly will apply to all battery types from car batteries, mobile phones, and general asset type tag batteries.

'G' is for Green and for GO with 'battery free' tags.

Advances in technology by innovative companies like Uwinloc, now mean that the same transmit/read distances and location accuracy are comparable with battery driven 'Active Tags'. Continuing with the sustainability theme, Uwinloc are also participants in the European MADRAS project, whose main ambition is to boost the production of organic and large-area electronics by establishing high-speed manufacturing methodologies using new materials based on in-mould hybrid and printed electronics. Uwinloc's tags are cheaper as they do not contain a battery. The TCO is also far lower since the labour-intensive replacement or associated maintenance cycles of tag battery replacement is removed. The overall effect on the planet regarding reducing the carbon footprint is reduced by using battery free products. Addressing the issue now could

just make a difference. We know that legally, the only safe way to recycle li-ion batteries is to have them processed by an authorised and correctly qualified electronic recycling facility, but the big question is: Why would you purchase costly battery driven, non-sustainable asset tag technology, when a 'Green' sustainable alternative with like-for-like performance is available with massive lower TCO benefits?

Stat Sources - Industry Revenue, Statistics, Forecast by Emergen Research