

SUNRISE...SUNSET

HOW YOU CAN ACTUALLY FEEL GOOD ABOUT END OF LIFE PLANNING

No one likes talking about end of life. But it's necessary, especially when it relates to dismantling equipment full of vital components that must be handled responsibly and sustainably. Freshly installed Uninterruptible Power Systems (UPS) start out as shiny new equipment, but everything has a circle of life, including the batteries that protect the massive amounts of critical data and transactions occurring daily. However, the type of battery technology you choose, can make you feel much better about the end of life choices you have to make. There are various battery technologies that power UPS systems. The predominant is lead, followed by lithium. One offers a credit and the other a cost. One promotes future sustainability while the other incurs a financial cost.

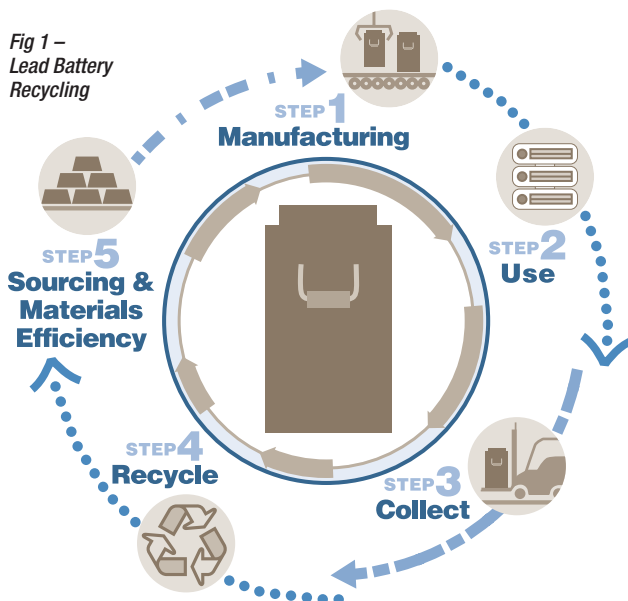
Let's start by taking a closer look at when a UPS is dismantled and what happens to these batteries.

END OF LIFE

LEAD BATTERY SOLUTIONS

End of life for lead is really a misnomer. Lead batteries are the most recycled consumer product with a **recycling rate of 99%**¹. The recycling and sustainability of lead batteries is a massive success story as virtually 100% of a lead battery's components are recyclable including the plastic, lead, and acid (See Fig 1). Not only is it recyclable, but also sustainable, meaning that its components are of great value and it is economically profitable to recycle them for use in new batteries. That creates an incentive and a substantial financial credit for the customer. This is a pinnacle example of a circular economy. In a way, lead batteries never die, they just become remade.

Fig 1 – Lead Battery Recycling



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LITHIUM BATTERY

Recycling and reusing lithium batteries is still under development. Unfortunately at end of life, the predominant options have been to ship overseas, possibly reuse it in other less technical application, place it in trash and landfills, or to properly dispose of it though the few existing processing facilities located around the globe. The responsible method is proper disposal. Current processes are tailored towards recovering individual components, such as steel, which is very valuable, and other components of the battery. While some additional base elements can be recovered, the majority of the materials recovered at the end are mixed plastics and an inert black mass which is further processed in an attempt to reclaim the core metals. It is critical to note, none of these processes are a comparable solution to the circular lead economy. Spent lithium products are not turned into new batteries. This lack of a circular end of life solution is an expense to the customer and potentially to society.

PAYMENT DUE OR CASH BACK?

A COST or CREDIT is solely dependent on your battery technology.

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CREDIT/LEAD BATTERY

In comparison to lithium batteries, a lead battery system offers a unique advantage because a financial CREDIT is offered when the batteries are returned for recycling. Let's look at an example that, uses a 1MWh UPS system with a standard 15 year life expectancy and Deka Fahrenheit lead batteries. This system offers savings both in lower initial capital investment and at the end of life. Based on a CREDIT of \$33/KWH, **the Deka Fahrenheit lead battery UPS system provides a lifetime Total Cost of Ownership (TCO) savings of over \$264,000³ compared to the lithium system.**

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COST/LITHIUM BATTERY

Specific to a lithium system, based on a study by the Electric Power Research Institute (EPRI), the COST to disassemble a 1 MWh lithium powered system is estimated at \$91,500 (\$91/KWH)². This includes the cost of labor, transportation, and lithium battery disposal. Keep in mind, lithium batteries must be discharged to a minimum capacity level (<30%) prior to transporting. Lead has no such requirement.

If you've invested in a lead battery system, you're already starting to feel better about your end of life planning. For a project to be a success it helps to remember to begin with the end in mind⁴. Knowing what happens to your batteries at the end of life is something that should make you feel good and not be another thing to worry about. It also makes good business and fiscal sense, and it's the right thing to do to be a sustainable partner to our environment. The good news is when it comes to lead batteries, there is no cradle-to-grave. There's just cradle-to-cradle.

Sources:

1 – National Recycling Rate Study, Battery Council International, 2019

2 – EPRI, Recycling and Disposal of Battery-Based Grid Energy Storage Systems: A Preliminary Investigation, B. Westlake

3 – The Smartest Battery Choice for Resilient, Profitable Data Centers, E.P.M. Form No. 2506

4 – Covey, S. R. (2004). *The 7 habits of highly effective people: Restoring the character ethic*. New York: Free Press

