



Dealing with the rechargeable battery problem

- With our close ties to the off-grid small home solar system sector, it became clear early on that batteries would be a problem fraction
- We have identified a few principles to guide us
 - Ensure reuse where possible
 - Identify battery sectors and prepare
 - E-Mobility and Commercial Storage longer term
 - Monitor the recycling options
 - Aim to process locally wherever possible

UNEP Global Electric Mobility Program


Used Electric Vehicles, Battery End-of-Life & Circularity – Africa Workshop

Battery Recyclers Perspective

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Reduce, **Reuse**, Recycle

Promoting the reuse of batteries before recycling them is a sustainable approach that aligns with environmental conservation, resource efficiency, and economic considerations

Extended Product Life:

- Reusing batteries in other applications can extend their overall lifespan, maximizing the value derived from the initial manufacturing process.

Reduced Environmental Impact:

- Reuse minimizes the environmental consequences of manufacturing by decreasing demand for new raw materials.
- Reusing batteries conserves energy and resources, making the process more sustainable and eco-friendly.

Promotion of Circular Economy:

- Reusing batteries aligns with this concept by keeping products and materials in circulation for as long as possible.

Technological Innovation:

- Stimulates innovation in refurbishment and repurposing technologies. This can lead to the development of new techniques and processes, fostering a more sustainable approach to battery management.

Community Engagement:

- Reuse initiatives can involve local communities in collecting, refurbishing, and redistributing batteries. This engagement can lead to the development of local economies and skills, promoting a sense of environmental responsibility.

Regulatory Challenges

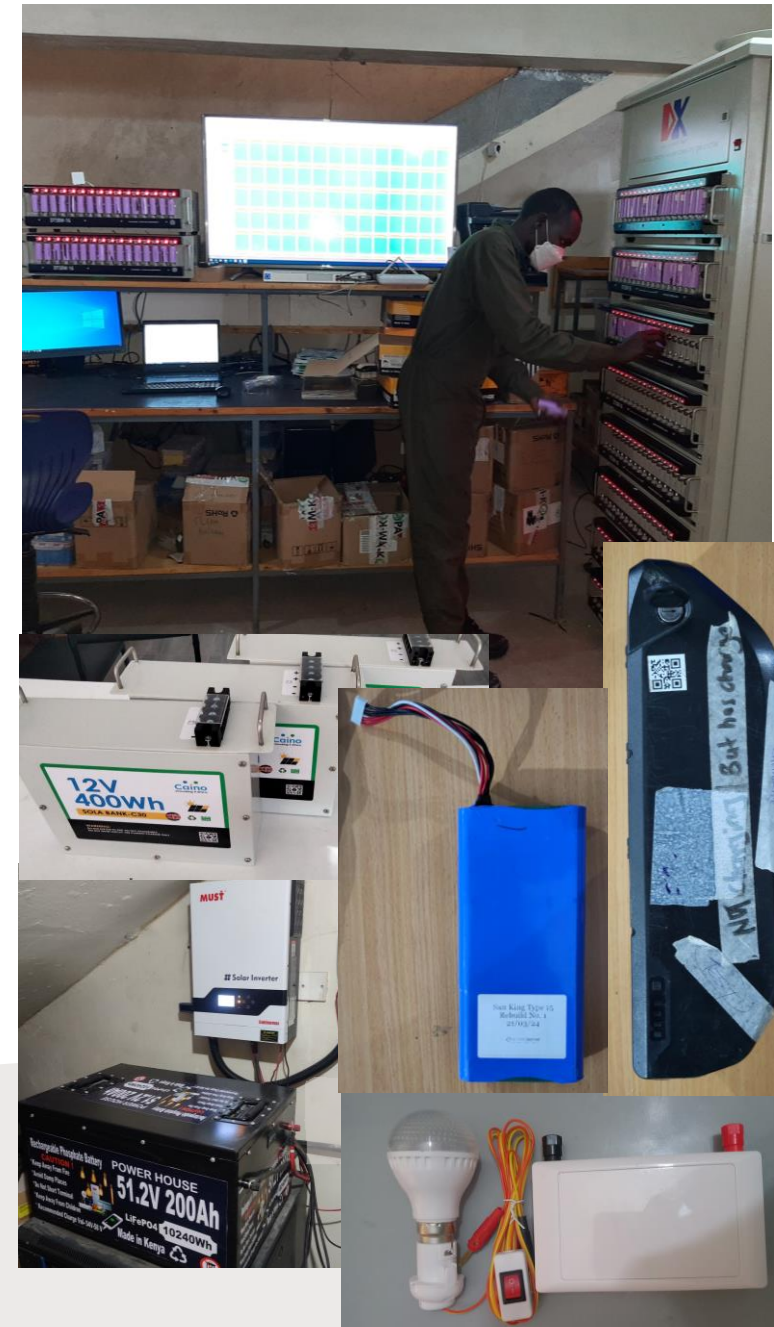
Almost 50% of the cobalt used in batteries comes from countries like Congo. Challenges like illegal mining, environmental harm, armed conflicts, and human rights abuses have been rampant in these countries.

Recycling lithium-ion batteries helps reduce the dependency on these materials, improve the security of the supply chain, and reduce the human and environmental impact brought by these batteries.

- Regulation can have unintended consequences
 - Basel prevents regional movement
 - Possible restrictions on black powder shipment
- Competing with new
 - Huge capacity and declining production costs
 - Regular new chemistries and fluctuating material prices
- Result
 - Recycling is uncompetitive unless regulation is supportive and adaptable, complementing commercial approaches

Lithium-Ion Battery Reuse and Re-cycling

- Enviroserve has received over 30,000 kgs of batteries from the off grid solar, e-mobility and other energy storage companies
- Plan to grow to match the market requirements
- We have installed battery testing equipment which gives us the ability to identify faulty battery cells and facilitate the reintroduction of the working battery cells back into the market
- Enviroserve's aim is to reduce the number of Lithium-Ion Batteries that will need to be shredded and recycled promoting the ability for our battery repurposing partners to grow and develop their businesses
- Enviroserve's battery testing project comprises of
 - Supporting local entrepreneurs with reliable tested second life cells
 - Identifying cells for re use for manufacturing partners themselves and collaborating in reassembly of battery packs
 - Repurposing custom built batteries for different energy storage solutions
- Recycling
 - With the second life project well under way, focus is on end of life is ongoing to identify the most appropriate scalable solution for Kenya – avoid expensive obsolete plant





Final Thoughts - Outlook

- The business model will need to constantly change to reflect the dynamic battery market
- Volumes will keep increasing but unpredictably
- Regulation should be light touch and supportive
- Challenge to producers
 - Design for reuse
 - Design for recycling
 - Where possible, keep ownership of battery packs and build in end-of-life management – Sell power not hardware, Africa can redefine the game

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