

LITHIUM-ION BATTERY RECYCLING PRIZE



U.S. DEPARTMENT OF ENERGY

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Submission Title:	Integrated pretreatment complex for Lithium-Ion batteries
Submission Track:	Track 2. Separating and Sorting

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Concept

- To establish two-tier LIB sorting/recycling system
- The first tier - decentralized preprocessing centers
- To preprocess LIBs into four categories: cathode materials, ferrous metal scrap, non-ferrous metal scrap and organic compounds mix
- Establish direct shipping to optimize logistics
- Ship safe compounds to decrease costs
- The second tier - industrial facilities able to sort different metal oxides based on their composition out of cathodes and re-use them in the production of new batteries
- Provide a universal scalable solution able to meet future volumes

Approach

- Use simple and easily manageable low capacity/throughput equipment able to sort out cathode materials from LIBs
- Put equipment components into one integrated automated complex able to preprocess batteries independently from their chemical composition
- Provide universal treatment by using several classification technologies
- Provide economic incentives for LIB originators in form of savings and additional revenue streams
- Make a sorting of LIBs a separate business line to support employment at local communities

Potential Impact

- Easily integrated with existing supply chain
- Whatever is collected and identified as LIB at solid waste management locations can be put into sorting
- Streamlines material flow
- Potential savings on logistics approx \$29 per ton
- Potential margin contribution \$12 per ton
- Recovery rate of cathode materials 90-92%
- Additional employment opportunity on local level