Circular Economy Working Group/ Used Lead Acid Battery Working Group

Developing Best Practices for Handling Used Lead Acid Batteries (ULABs)

Mathy Stanislaus

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Environmental and Public Health Benefits of Lead-Acid Battery Recycling Programs in the U.S. from 2012-2016:

- **Recycled 12.15 Billion pounds of lead**
- **Prevented 71,410 years of disability (Disability Adjusted Life Years)**
- **Reduced GHG emissions by 1,360,000 Metric Tons of CO2eq (as much as the annual emissions of a medium-size power plant)**
- **Prevented the emission of 168,600 metric tons of sulfur dioxide (SO2), 37,600 metric tons of coarse particulate matter (PM10), 15,960 metric tons of phosphorous (P) and 73.76 Million metric tons of polluted soil**
- **Reduced overall environmental damages by 92% (compared to mining and processing new lead)**

Ramon Sanchez, ScD
Chair, RBC Science Advisory Board
Director of the Sustainable Technologies and Health Program, Center for Health and the Global Environment,
Harvard T. H. Chan School of Public Health.

Key Areas for Developing Best Practices for Handling Used Lead Acid Batteries (ULABs)

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Knowledge Partner Leads

PURE EARTH
BLACKSMITH INSTITUTE

responsible battery coalition

AMARA RAJA
Gotta be a better way

Objective: Develop a model ULAB recycling improvement program for replication in low- and middle-income countries with a key outcome to reduce children's exposure to lead due to informal recycling practices.

Best Practices for the Environmentally Sound Management and Recycling of Used Lead-Acid Batteries: Draft Framework

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I. Background on lead-acid battery use, the recycling industry, negative externalities of unsafe recycling, and benefits of a closed loop system

- Safe ULAB recycling as a model example of a circular economy
  - Economics of closed loop ULAB
  - Key elements of a closed loop ULAB System
- Health impacts from exposures to lead pollution and the contribution of unsafe ULAB recycling
- Economics impacts from lead poisoning and the estimated contribution of unsafe ULAB recycling
- Discussion of the informal recycling economy in emerging economies
- The importance of, and need for LABs in the current economy and the insufficiency of lithium ion batteries as a replacement in the medium term

Best Practices for the Environmentally Sound Management and Recycling of Used Lead-Acid Batteries

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Guidelines for Best Practices for ULAB Recycling

- Technical guidelines for best practices for **formal sector ULAB recyclers and lead smelters** – the EU and USA example, (and other countries).

- **Licensed recyclers and smelters that underperform; e**conomic, regulatory, enforcement, and public policy solutions to encourage the adoption of best practices.

- Recommendations to reduce rates of unsafe battery recycling in the **informal sector** and the associated health and economic impacts from lead pollution

  - Incentives to encourage adoptions of best practices among formal sector operators that currently underperform

The “Battery Passport” – Date Traceability to Close the Loop on Batteries

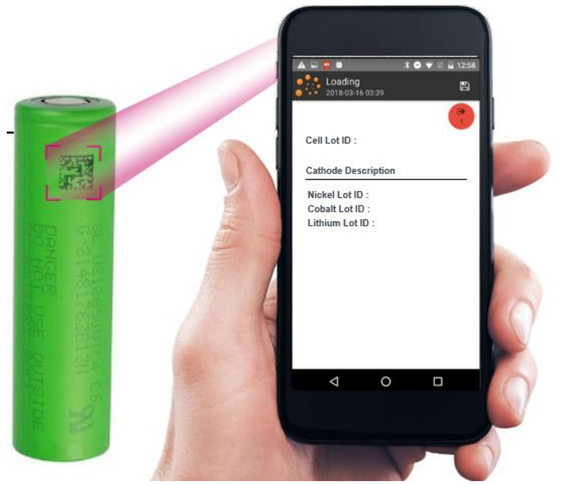
Objective

Explore the viability of an **open source** common platform via a battery ‘passport’, or digital identity, that can capture essential information to:

- Demonstrate responsible practices from extraction to end of life material recovery
- Communicate relevant /data information, with security protections, to critical circular economy stakeholders involved in repair, refurbishment, repurposing and recycling
- Enable efficient and responsible recovery of essential metals and other resources at EVB end-of-life
- Technology neutral and be interoperable through out value chain

2019 deliverable

- A framework documenting the information and process towards a battery passport
- A prototype



Knowledge Partner Leads

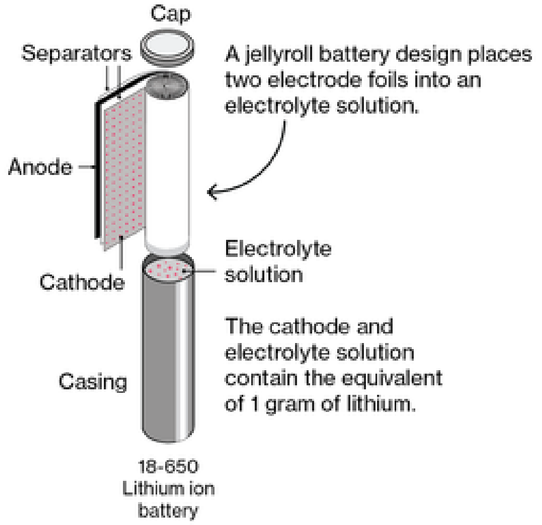
OPTEL EVERLEDGER

Key dates

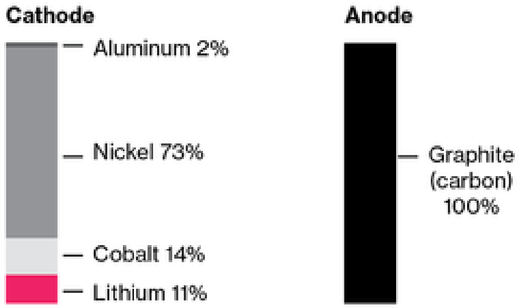
- **March:** Conduct parallel consultation with three groups of stakeholders:
  1) recyclers/repurposers,
  2) manufacturers
  3) upstream sourcing stakeholders
- **18 or 19 April:** Consultation workshop
- **End of August:** Develop Initial Draft Material Passport design

New partners (aligning with upstream/sourcing): SAP

Battery Traceability @ Cell Manufacturer



Active materials in a typical Lithium Nickel Cobalt Aluminum Oxide battery



Key Life Cycle Phases for Tracing Data