Efforts Towards Establishing Inventories of ULAB in Ghana

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1. The lead-acid battery recycling industry in Ghana

Although lead-acid batteries (LABs) are most commonly used as starter batteries in vehicles, they are also widely used for stationary power storage. This function is particular importance in Ghana:

- Frequent blackouts require power back-up systems for many electrical and electronic appliances. E.g., desktop PCs can only be operated without risking data-losses in Ghana if connected to an uninterruptible power supplies (UPS). Each of these small-size UPS is equipped with one lead-acid battery.

- LABs are used in decentralize power generation systems (solar power for local use) and as power back-ups for server systems, ctelecommunication masts/towers.

- For critical infrastructure such as hospitals.
1.1. Data sources

- Vehicle and other LAB bearing/dependent imports from Customs (GCNet)
- Driver and Vehicle Licensing Authority
- Energy Commission and Solar Importers Association
- Ghana Chamber of Mines
- ULAB Collectors/export (Go through BC notification)
- Formal ULAB Recyclers - monthly reporting through AKOBEN
- Scrap Metal Exporters - illegal
- Garages and battery chargers
1.2. Estimation of annual ULAB volumes

- There is no accurate data on the volumes of used lead-acid batteries (ULABs) generated per year in Ghana. Nevertheless, such a figure can be estimated using the following baseline data and assumptions:
  - 0.82 million passenger vehicles in Ghana in 2015 (GCNet, DVLA, Manhart, Schleicher et al. 2014)
  - 0.54 million trucks and buses in Ghana in 2015 (GCNet, DVLA, Manhart, Schleicher et al. 2014)
  - 2.51 million desktop PCs in Ghana in 2015 (GCNet, Manhart, Schleicher et al. 2014)
  - Average life-time of vehicle LABs in Ghana: 2 years
Warm climate and rough roads are both factors that shorten the life-time of vehicle batteries. Thus, two years seem plausible in the West-African context.

• Average life-time of stationary LABs in Ghana: 5 years
• Average weight of LABs per passenger vehicle: 20 kg
• Average weight of LABs per bus or truck: 2 x 50 kg
• Average weight of LABs per small UPS (one per desktop PC): 3 kg
## Estimation of annual generation of used lead-acid batteries

<table>
<thead>
<tr>
<th>Type of appliance</th>
<th>Devices in use</th>
<th>Average weight of LAB</th>
<th>Average life-time of LAB</th>
<th>ULAB generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger vehicles</td>
<td>0.82 million</td>
<td>20 kg</td>
<td>2 years</td>
<td>8,200 t / year</td>
</tr>
<tr>
<td>Buses &amp; trucks</td>
<td>0.54 million</td>
<td>2 x 50 kg</td>
<td>2 years</td>
<td>27,000 t / year</td>
</tr>
<tr>
<td>Desktop PCs + UPS</td>
<td>2.51 million</td>
<td>3 kg</td>
<td>5 years</td>
<td>1,506 t / year</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>36,706 t / year</strong></td>
</tr>
</tbody>
</table>

Source: Own calculation
Management paths of ULABs in Ghana

1. Waste battery collection
2. Acid drainage
3. Battery breaking & lead scrap extraction
4. Smelting of raw lead ingots

Export option 1: Export of wet lead-acid batteries
Export option 2: Export of drained lead-acid batteries
Export option 3: Export of lead-scrap
Export option 4: Export of raw lead ingots

City Waste, Scrap dealers, Blancomet, Fidev, Goldline, Gravita, Success Africa, Non-Ferrous

Source: (Manhart & Schleicher 2015)