



National case of Scrap Lead-acid batteries Management in Ghana

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Introduction; Hazardous Wastes

- Policies and Legislations
- ULAB
- E-Waste
- Hazardous solid waste imports
- Waste Oil

What is in the normal Pb-acid Battery?

A modern Pb-acid battery basically consists of

1. polypropylene (PP) casing,
2. plates (grids and paste,
3. connectors/poles, bridges,
4. sulphuric acid [H_2SO_4] and
5. PP-separators as insulators between plates.

An average battery weighs between 13-24kg.

- The metal from the grids, terminals and bridges contain about 44% Pb and antimony
- the paste comprises of about 56% Pb oxide and lead SO_4 .

ULAB Recycling Facilities in Ghana

Name of Facility	Process Stage	Installed Capacity
Gravita Ghana	Smelting to Pb ingots	1,200MT/Month
Goldline	Smelting to Pb ingots	1,200MT/Month
Success Africa	Smelting to Pb ingots	1,200MT/Month
Blancomet (Boliden)	Partial Processing - no smelting	1,200MT/month
Fidev Recycling	Partial processing - no smelting	200MT/Month



Sources of raw materials

- In-country

Transport sector: Garages,

Solar Installations,

Telecommunication Transmission towers

Desktop PCs and UPs

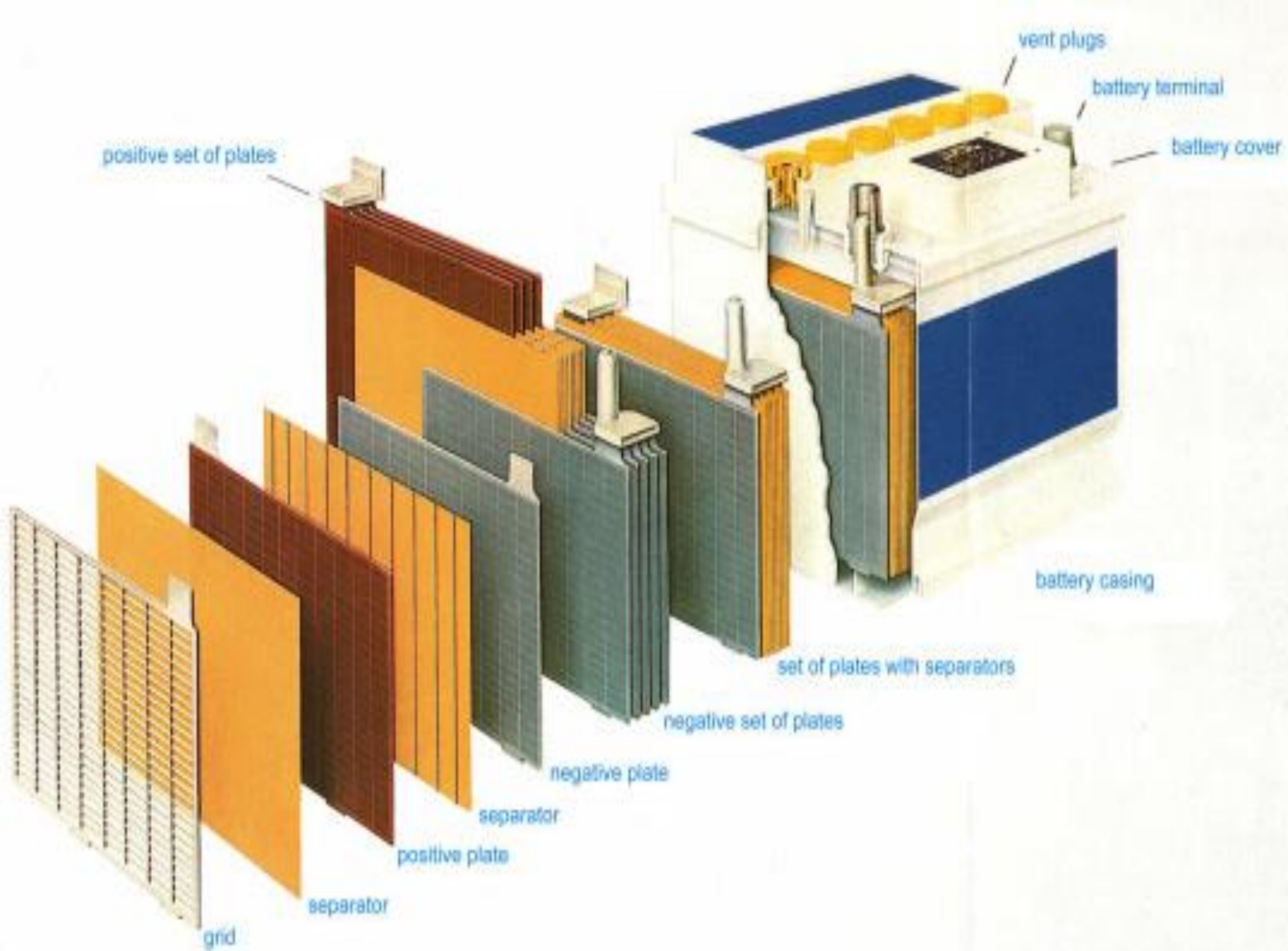
- External imports:

ECOWAS member countries

Estimated annual generation of ULAB in Ghana

(excluding solar and Telecom sector - studies ongoing)

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



Process Options adopted by Facilities in Ghana



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



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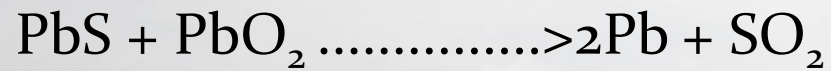
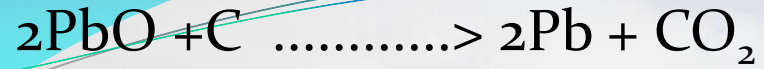
VERTICAL FURNACE.pdf



CHEMICAL TREATMENT PLANT.pdf



Reactions in Furnace



Cyclone Side) and Baghouse (down)



Looped wet scrubber to remove gaseous pollutants



Comparison of survey results of blood-lead levels in and around ULAB recycling industries in Ghana, Senegal and Kenya

	Ghana	Senegal	Kenya
Location	Kpone industrial area, Tema	Thiaroye sur Mer, Dakar	Owino-Uhuru settlement, Mombasa
Facility			
Year of survey	2010	2009	2015
Scientific reference	(Lomotey H. S. 2010)	(Haefliger P. et al. 2009)	(Kenyan Ministry of Health 2015)
Group tested	Employees of secondary lead smelter	Residents within informal recycling cluster	Residents of community next to secondary lead smelter
Number of tested individuals	20 adults	81 (50 children, 31 adults)	50 adults (10 former employees)
History of case	See above	Prior to survey 18 children died from lead poisoning	Public complaints and claims that at least 3 workers had died from lead-poisoning
Mean blood-lead level	146.34 µg/dl	101.1 µg/dl	43.66 µg/dl
Minimum blood-lead level	3 µg/dl	32.5 µg/dl	< 4.7 µg/dl
Maximum blood-lead levels	278 µg/dl	613.9 µg/dl	420 µg/dl

E-Waste

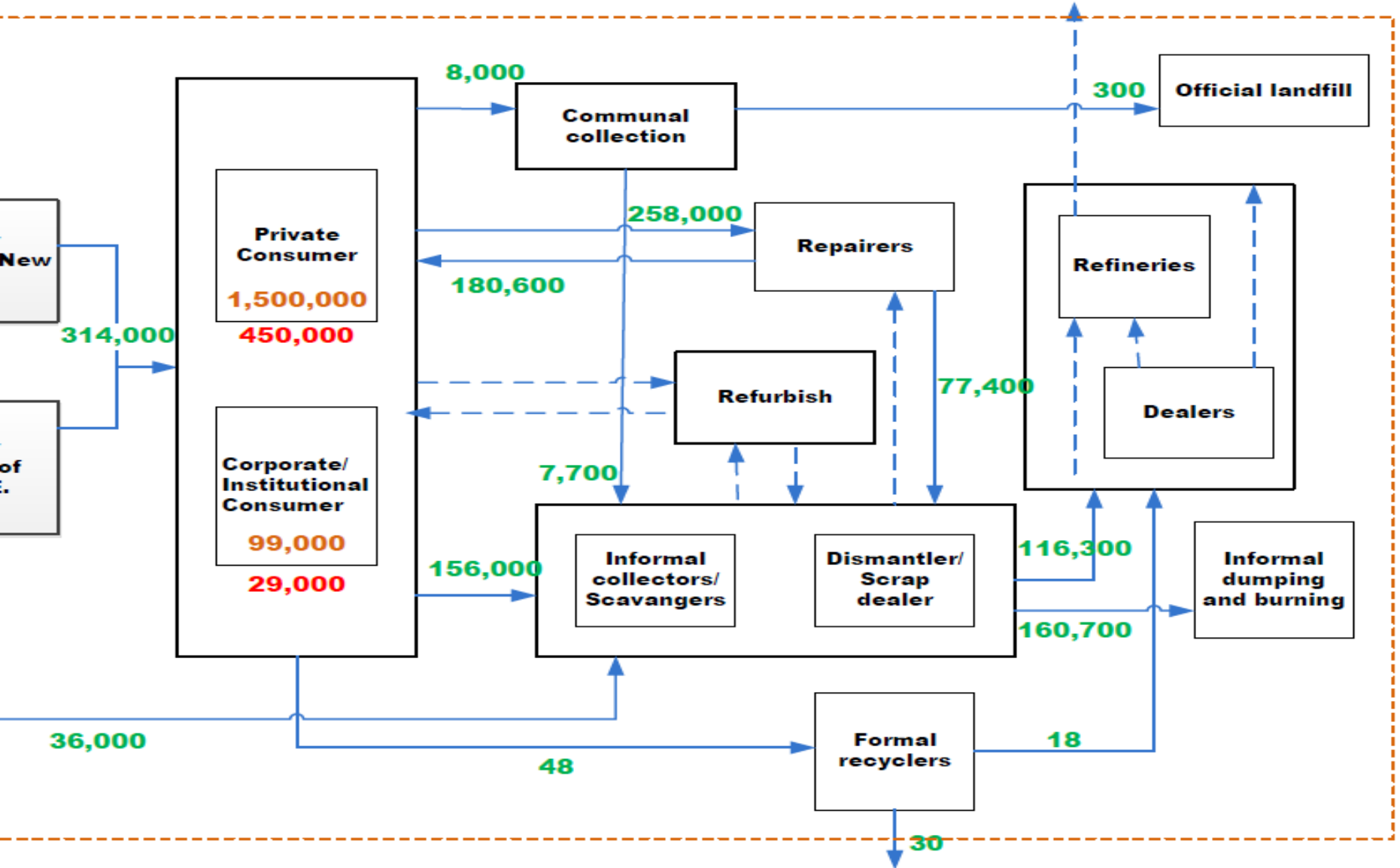
Quantified flows

Quantified flows

Flow of (U)EEE
(Tons/Year)

Installed Base of
EEE (Tons/Year)

Stored Base of
WEEE (Tons/
Year)



Legal, Regulatory and Policy Framework on E-Waste

- 1.The 1992 Constitution of the Republic of Ghana;
- 2.National policies -
 - a.Ghana ICT for Accelerated Development (ICTAD) Policy;
 - b.National Policy on Public Private Partnership;
 - c.National Environmental Policy;
 - d.Occupational Safety and Health Policy of Ghana
 - e.National Energy Policy; and
 - f.Environmental Sanitation Policy;

National laws and regulations -

- a.Environmental Protection Agency Act;
- b.Environmental Assessment Regulations;
- e.Energy Commission Act;
- f.Energy Efficiency Regulations;
- h.Mercury Law;
- j.Export and Import Act;
- k.Ghana Revenue Authority Act;

Challenges

- Monitoring: Human and Logistics for field work
- Inadequate or lack of trained auditors in compliance enforcement, negotiation skills and conflict resolutions
- Legitimate limitations of the EPA Laws, Regulations and the powers of inspectors
- Interferences from people in positions of influence

Compliance Enforcement

- Monitoring inspections to sites on persistent violations or non-compliance; compressive documentations
- Consistent feedback to violators stating problems, severity and demand a timetable for solving problems
- Negotiated positions
- Issuance of notices and directives with timeliness
- Issuance of closure notices and effecting closures for corrections to be effected before resumption
- Prosecution: Big problem???

Steps to overcome challenges

- Positive Government
- (1) Hazardous and Electronic Waste control and Management Act 2016, Act 917 (Fund)
- (2) Hazardous, Electroical and other wastes control and management regulations 2016, LI 2250
- (3) Facilitating Private sector establishment of a state-of-the-art electronic waste facility at Agbogbloshie
- (4) Setting up of buy-back centres throughout the country by the private sector

A scenic landscape featuring a large body of water in the middle ground, with rolling hills in the background under a cloudy sky. The foreground is filled with tall, dry grasses and some green plants. A decorative banner with blue and white wavy lines is positioned at the top of the image.

THANK YOU