



Baseline Study

Assessing the baseline of the e-waste sector in Ghana

Environmentally Sound Disposal and Recycling of Electronic Waste Programme (E-Waste Programme)

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1. Project Description – E-waste Programme

1.1 Background of the E-waste Programme

Population growth, increasing prosperity and changing consumption patterns in Ghana are leading to increasing amounts use of electrical and electronic as in other developing countries. Consequently, the country is confronted with growing quantities of electrical and electronic waste (e-waste). In addition, imported second-hand appliances with a comparatively short remaining life are imported and used in Ghana. An estimated 15 per cent of these appliances are already broken when they enter the country.

Ghana does not have a sustainable, efficient recycling system for the management of e-waste. The Old Fadama scrap market, better known as Agbogbloshie, is located in the centre of the capital Accra. It is famous throughout the world as an example of improper and informal recycling of e-waste and the environmental and health problems this entails. The soil and surface water are polluted by heavy metals and persistent organic pollutants. When electrical cables are burnt, toxic gases are formed, often causing respiratory diseases. In addition, greenhouse gases are emitted, because of the improper recycling of refrigerators.

The Government of Ghana has recognised this challenge and adopted the Hazardous and Electronic Waste Control and Management Act 2016 (ACT 917), thus creating the legal framework for more sustainable e-waste management. Additionally, the Legislative Instrument (LI 2250) was adopted. Technical Guidelines on e-waste management are in the process of being operationalized.

At present, recycling and reuse of e-waste in Ghana is predominantly done by the so-called informal sector. It provides a livelihood for many, while some processes in the informal sector are having severe impacts on people's health and the environment. Materials that are of no value to the informal waste collectors and processors are burnt or disposed of illegally with no regard for local or global repercussions. This method is cheap in the short term and gives the informal sector an economic advantage over the formal recycling industry, which complies with environmental, health and social standards.

Nevertheless, there is great potential in informal recycling. The current collection system achieves very high collection rates (95 % of Ghana's e-waste). Moreover, the informal sector provides a source of income and employment for unskilled disadvantaged young people, particularly for those who move to the capital Accra from the north of the country. Overall, there is a need for improving the conditions for sustainable recycling of e-waste in Ghana.

1.2 Approach of the E-waste Programme

The E-Waste Programme aims to improve the conditions for sustainable management and disposal of electronic waste (e-waste) in Ghana. The programme for technical cooperation is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by "Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH" in partnership with the Ghana Ministry of Environment, Science, Technology and Innovation (MESTI) . To achieve the objectives, the E-waste Programme will work in the following areas:

- The policy framework for sustainable management of e-waste is improved
- Economically viable business models are introduced and developed. This is kick-starting and promoting a sustainable e-waste recycling sector.
- Through capacity development, informal sector players at micro level are enabled to make e-waste management more sustainable and less damaging to the environment and the population's health.

In addition, measures are being implemented to allow the various stakeholders to share their experiences and to set up networks. A multi-stakeholder approach was selected to achieve the joint programme objective. Political institutions at national and local level, the private sector and the informal sector are all included:

The project focuses on capacity development for the partner institutions at individual and organisational level. Capacity development at MESTI and at the Ghana Environmental Protection Agency (EPA) is designed to enable them to set up the legal framework for sustainable e-waste management. Additionally, the political partner and the partner organisations are supported in setting up the recycling fund provided for in the national e-waste legislation. The fund will finance sustainable recycling along the recycling chain of e-waste in Ghana. An eco-levy will be charged to manufacturers, importers and producers at the port of entry or when electrical and electronic devices are put on market.

Technical and in-process advice is provided to promote the development and introduction of economically viable business models for recycling and disposing of e-waste in the formal recycling sector. Political and private sector decision-makers are enabled to develop and assess technological and business options for e-waste management, including operator models. The project supports a joint understanding of appropriate technical solutions and their financial, social and environmental impacts through comprehensive communication and network activities. Furthermore, alternative income opportunities along the recycling chain are explored.

The project promotes the individual and organisational skills of people and companies directly and indirectly involved in and impacted by recycling and disposal processes in the informal sector. The project provides training in recycling and disposal methods being less damaging to the environment and people's health. These trainings will be open for e-waste collectors and recyclers who are willing to change. Part of it, will be education about a better understanding of the negative impacts of current practices on health and the environment.

1.3 Background and Methodology of the Baseline Survey

For the activities in the informal sector a separate and comprehensive baseline survey was conducted between January and April 2018. In total more than 250 interviews on two different scrapyards were made. For the activities in the policy sector and for the formal recycling sector already existing studies were reviewed and summarized, to avoid duplication of work. Especially, studies published by the Sustainable Recycling Industries project provide a comprehensive overview about the status of the implementation of the E-waste legislation and about the E-waste recycling industry at the beginning of the E-waste programme.

1.4 Objective of the Baseline Survey

The main objective of the baseline survey is to describe the framework conditions of the E-waste Programme at the beginning of the first phase of the programme. In the sector of e-waste management, programmes like the sustainable recycling industries (SRI) have published studies regarding E-waste. For more comprehensive overviews regarding the legislation and the status of formal recycling companies, the publicly available baseline survey of the SRI programme is recommended. Finally, the baseline survey, shall help to measure, if the objectives of the E-waste Programme are achieved.

2 Regulatory Framework for Sustainable E-waste Management in Ghana

The ministry of environment, science, technology and innovation (MESTI) is in charge of developing policies in the sector of e-waste management. The Environmental Protection Agency (EPA), has the responsibility to develop guidelines and standards for the implementation of the legislation. Consequently, MESTI and EPA are the main political partners of the E-Waste Programme.

2.1 Legislations used to regulate e-waste recycling prior to the specific e-waste ACT

Main political instruments include the topic of environmental protection. Therefore, the general legal groundwork for sustainable e-waste management was already given. The judicative framework for environmental protection is rooted in the 1992 Constitution of Ghana. It states that measures and international cooperation are needed to protect the environment on a national and international level. It does also cover occupational health as it is the state's duty to ensure health, safety and welfare of every employed person. Furthermore, it takes every individual citizen into responsibility to safeguard the environment.

Secondly, the National Environmental Action Plan (NEAP) was published in 1991. Its main goal is to require the state to protect surroundings, living conditions and quality of life of present and future generations. It also includes the restriction of imports of toxic substances and control of environmental pollution by restricting harmful and destructive practices. In general, it provides a broad framework for the control and management of potentially toxic substances including those from uncontrolled e-waste management. Appropriate measures taken by the state include environmental work at all levels of development and work on common solutions on environmental protection on an international level in West Africa, Africa and on a global scale.

On an international level Ghana has ratified several wastes related International and Multilateral Environment Agreements including The Basel Convention, The Vienna Convention and The Stockholm Convention. These mostly determine control and regulations of hazardous substances.

Although the above-mentioned agreements cover harmful substances which are included in e-waste, they do not specifically address the dangers to human health and the environment. The Environmental Protection Agency Act (Act 490) has led to the establishment of the Environmental Protection Agency (EPA) in 1994. Of all official acts it relates most to WEEE. EPA's role in environmental protection relates to coordinative activities, prescription of guidelines and standards and controlling mechanisms. In addition to establishing the EPA, the Hazardous Chemicals Committee was established under Section 10 of the Act that covers monitoring and information about the use of hazardous substances.

2.2 The hazardous and electronic waste control and management bill (Act 917)

In March 2016 the Parliament of Ghana passed ACT 917 “The Hazardous and Electronic Waste Control and Management ACT, 2016”. It was based on the initial document developed by EPA in 2011 that provides guiding strategies and policy steps of sound e-waste management intended for national adaption.

Waste types covered by this bill are hazardous wastes and e-waste. Generally, it restricts import, export and transportation of such to ensure safe and environmentally sound treatment of waste. Regarding e-waste the regulations aim at establishing sustainable management of e-waste in Ghana. ACT 917 is implementing the Basel Convention into national law. Measures regarding e-waste management, include import and export of electrical and electronic waste, the designation of an external service provider, the establishment of an Electrical and Electronic Waste Management Fund and the establishment of recycling facilities.

Additionally, it enforces producers of electronic and electrical equipment to take back used electronic equipment. Furthermore, the principle of polluter-pays is established, as an eco-levy will be collected from manufacturers, importers and retailers. The Fund should cover activities including, collection, construction and management of electrical and electronic waste recycling plant and related facilities, research and public awareness, education, construction and maintenance of recycling methods and facilities. Additionally, funds will be disbursed to the Ministry responsible for the environment and the EPA.

The legislative instrument relating to ACT 917 is the “Hazardous, Electronic and other Wastes (Classification), Control and management Regulations, 2016” LI 2250. The purpose of this regulation is to, regulate the classification of waste, prescribe requirements for take-back systems, prescribe requirements and timeframes for the management of listed wastes, prescribe general duties of waste generators, waste transporters and waste managers. Finally, it prescribes requirements for the disposal of wastes. Regarding e-waste, it regulates the roles of producers of e-waste, refurbisher and repairer, dismantler, recycler and persons who operate collection centres.

2.3 Regulations on the import and end-of-life management of refrigerators, freezers and air conditioners

Against the background of national policy to regulate the use of electrical equipment for environmental protection the Energy Efficiency Regulation was adopted in 2008 (referred to as L.I. 1932). Specifically, it regulates prohibition of manufacture, sale or importation of incandescent filament lamps, used refrigerators, used freezers and used air conditioners. Primarily it aims at

reducing amounts of toxic substances such as ozone-unfriendly chlorofluorocarbons (CFCs). Secondly, it intends to reduce the energy burden on its national grid and promote energy efficient use of electrical appliances as energy consumption of used refrigerators and freezers is significantly high compared to new equipment. This was partly initiated by the Energy Commission. Today actions of transportation, import, distribution or sale of used refrigerators, refrigerator-freezers and freezers are considered a criminal offence. Infractions can lead to fines up to 250 penalty units or prison. In cases of import of such equipment into the country, it must be seized and destroyed within four weeks. For this purpose, an agreement among the Energy Commission and the private Presank Company Limited has been made that is the responsible partner to cover all recycling and disposal activities in Tema.

2.4 Standards and guidelines in Ghana

Generally, standards and guidelines regarding processes or recycling of e-waste are set by EPA. There is a need for guidelines concerning the treatment of e-waste because it provides the legal groundwork to guide and act on companies juristically. Standards have a legally binding function in Ghana. Below the level of standards, there are guidelines, which fulfil similar functions. Nevertheless, sanctions based on guidelines could be contested juristically. Compared to the standards setting process the process for guidelines is less complex.

The Technical Guidelines on Environmentally Sound E-Waste Management for Collectors, Collection Centers, Transporters, Treatment Facilities and Final Disposal in Ghana have been developed by the Environmental Protection Agency (EPA) with the support of the project “Sustainable Recycling Industries” (SRI). EPA is in the process of finalizing and operationalizing them.

The guidelines divide the e-waste management in five Tiers: collectors (Tier 1), collection centers (Tier 2), transporters (Tier 3), treatment facilities (Tier 4) and final disposal (Tier 5). Based on the legal situation in Ghana and the international standards for dealing with e-waste, concrete instructions for action and guidelines are issued on the five levels. They provide the basis for the integration of the informal sector into a sustainable recycling scheme for Ghana. They are easy to understand and clearly verifiable.

First and foremost, comprehensive registration of all parties, including informal collectors, is mandated. Furthermore, requirements for working conditions, such as rain protection or safe transport containers and protective equipment are described. Verifiable minimum requirements are set. The document can be seen as a simplified, clearly formulated variant of the law, which can also be passed on to the individual parties.

3 Formal Recycling Sector in Ghana

There are various registered companies in Ghana that are either already active in e-waste management and recycling, or that have plans to enter this field. In general, almost all waste contractors receive through the collection of municipal solid waste some types of electronic waste. Table 1 provides a list and a short description of companies being involved or planning to involve in electronic waste management. Considering the current dynamics in the waste management sector in Ghana – it is very likely that some companies are not included. As of now, recycling companies in the field face difficult legal and market conditions. The legal framework for e-waste management in Ghana is not fully developed yet. Furthermore, the mode of disbursement for providing environmental services from the E-waste Recycling fund are not described. Additionally, formal recycling companies face unfair competition from the informal recycling sector. Informal recyclers do not have to cover for the costs of disposal of hazardous e-waste types. Furthermore, operational health and social standards in the informal sector are significantly lower than in the formal recycling sector. This results in a complicated framework conditions for formal recycling companies.

From the current perspective, the listed companies can be grouped in the following clusters:

- Companies with main activities in municipal waste management that plan to diversify
- Companies with main activities in management of industrial hazardous waste
- Companies primarily focusing on the recycling of lead-acid batteries
- For-profit or non-profit ventures to re-use/re-cycle e-waste as a main activity

*Table 1 List of Companies already involved of planning to be involved in E-waste Management
(Adapted from SRI Baseline Survey)*

Company Name	Main Fields of Activity
Green Advocacy	non profit, primary focus on sound cable recycling
Atlantic Recycling International	developed recycling activities out of its repair and re-use activities for EEEs
Asadu Waste	General residential and commercial waste management
Blancomet Recycling Ltd.	Important role in international scrap trading, cable and ULAB recycling as well as normal waste processing
City Waste Recycling	pioneering sound e-waste recycling, full range e-waste treatment including fridge degassing and granulation of cables
Close the Loop	Mobile phone recycling, global extended producer responsibility
FIDEV Recycling Ltd.	20 years of scrap trading, ULAB and plastic recycling as well as dismantling
Goldline Ghana Ltd.	Full range e-waste treatment and ULAB plastic processing
Gravita Ghana Ltd.	ULAB processing
Ismart Ltd	Planning to enter the sector
J. Stanley-Owusu & Company Ltd	e-waste processing research only as well as hospital waste processing
Jekora Ventures Ltd	General waste management, Innovative approach including separation at source
Kumasi Waste Management Limited	Waste Contractor in Kumasi
Liberty Waste	General waste management
Presank Enterprise Ltd	main focus on research, cable recycling and fridge degassing
Success Africa Ghana Ltd.	focus on ULAB only
Vermark Environmental Services	General waste management
Zeal Environmental Technologies (Takoradi)	dismantling and ULAB management, Waste management for the Oil Industry
ZOIL Services	only research in e-waste management
Zoomlion Ghana Ltd	Biggest waste management company in west Africa, plans to enter into the E-waste Sector

4 Informal Recycling Sector – Old Fadama Scrapyard (Accra) and Oforikrom Dagomba Line (Kumasi)

4.1 Status of informal e-waste recycling in Agbogbloshie and its surroundings

Two related events on and in the surroundings of the Old Fadama scrapyard in Old Fadama impacted its development. In June 2015, heavy rain showers caused a flood in Accra. Increasing water levels at a filling station caused gasoline to escape. An explosion occurred. In this fatal incident 159 people lost their lives. Blocked drainage channels and illegal settlements were blamed for this. Hence the government supported by police and military force acted and cleared a 100m perimeter from the Odaw River. This resulted in bulldozing of houses in Old Fadama settlement. Scrap dealers lost their shelter. Yet, neither the flooding nor the government actions had any influence on the informal scrap dealing business.

A new development that took place in Agbogbloshie is the dumping of household waste in a “transfer station”. Household and commercial waste was disposed-off against a fee. The Old Fadama scrapyard, was not only used for scrap dealing and recycling but as well a dumping site with all its negative effects. This solid waste disposal was not directly linked to the scrap dealers organized in the Greater Accra Scrap Dealers Association (GASDA). Hence the scrap dealers feared to be blamed for the negative side effects of the dumping site. In 2018 the dumping of household waste has stopped.

4.2 The informal sector on the Old Fadama scrapyard and in Kumasi

Recycling of e-waste in Ghana is predominantly informally organized. The most famous informal scrapyard is located in Old Fadama in the Greater Accra Region. Scrapyards are not limited to Accra. Additionally, in Kumasi the biggest scrapyard is at the Oforikrom Dagobma line. On both scrapyards a variety of processes is taking place. First and foremost, informal collectors have developed a highly effective collection scheme for all sorts of valuable scrap, including e-waste. So-called boys are walking through the streets of Accra and collect/buy scrap from households. In the evenings, they walk back to the scrapyards and sell or deliver the collected scrap to scrapdealers. On the scrapyard materials are accumulated, functionality of electronic gadgets and its components is tested, dismantling conducted and new products are produced. Some of their methods of extracting fractions (particularly copper burning) are considered unsafe and could lead to interminable environment and health consequences.

Around 1,500 dismantlers and 4,000-5,000 collectors operate in the Old Fadama scrapyard. In Oforikrom, there are about 300 scrap/e-waste workers. Over 90 percent of workers at the scrapyards belong to the ethnic groups that are typically located in northern Ghana, with the Dagomba ethnic

group forming about 60 percent of the population in both scrapyards. More than half of them were younger than 25 years. With little or no formal education, over 95% of the workers learned their trade through apprenticeships (informal vocational training) or natural talent. In Old Fadama, women are exclusively engaged in ancillary services. However, in Oforikrom some women are engaged as scrap dealers and the rest engaged in ancillary services.

The average monthly income of scrapworkers in Oforikrom was a bit higher than those in Old Fadama (Gh¢900 or US\$200 against Gh¢820 or US\$182 respectively). The largest part of their income came from e-waste dealing (buying and selling e-waste). Most of them lived in rented buildings made of wood. Interestingly, mobile phone ownership among scrapdealers is higher than in the urban population of their respective regions. A tenth of workers in Old Fadama and a third of those in Oforikrom had two or more phones.

Clinics and hospitals are the primary source to about a quarter (26%) of the scrap dealers in Old Fadama. There seems to be a lack of clinics/hospitals in Old Fadama scrapyards. Furthermore, the long distance to the nearest health facility, cost of transportation and the high number of uninsured workers could contribute to that. Around 60 percent of workers in Old Fadama said they could not afford to pay for their health care.

Sanitation facilities (toilets) are available in their scrapyards/vicinity. However, those in Old Fadama were pan/bucket toilets, which are unhygienic. Only 68 percent of workers in Old Fadama reported that they can afford to pay for the usage of sanitation facilities. As a result, only half of the scrap workers use them regularly.

Almost half of the workers were aware that e-waste could negatively affect the environment. However, more than half (65%) of the workers had knowledge of the negative impact of e-waste on health. They often cite body pains, tiredness, headaches and fever as the symptoms e-wastes effect on their health.

Additionally, whereas workers in Oforikrom said they had no recreational facilities, those in Old Fadama had four video centres where they go to watch broadcast football matches and movies. Out of those who said recreational facilities were available in the scrapyards/vicinity, 93 percent had regular access to them. No worker in Oforikrom had access recreation in the scrapyard/vicinity and sought other ways of entertaining themselves at home or outside the scrapyard. The findings suggest that football was a popular pastime for workers in Old Fadama. In average workers in Old Fadama walked for 5 minutes (0.4km) to access recreation, which is five times shorter than the 25 minutes

(2km) that their colleagues in Oforikrom used. Almost everyone in Old Fadama scrapyards supported the idea of renovating the dysfunctional football pitch in their scrapyards.

Moreover, the survey found that a little over a tenth of workers had high/expert level of knowledge (more than 10 years' experience) in informal e-waste processing. More than 95 percent of the workers in each scrapyards acquired the skills for their work through informal apprenticeship or natural talent. About half (53%) of workers in Old Fadama ranked themselves as novices (or least skilful) in e-waste processing compared to nine percent of Oforikrom. This suggests that the perceived need for skill improvement training is higher in Old Fadama.

Conversely, 62 percent of workers in Oforikrom and 15 percent of Old Fadama, considered themselves very skilful (expert level) in e-waste processing. Despite the apparent need for skill improvement training, quite a few (2%) of the workers ever participated in any skill improvement training. This can be partly attributed to the lack of skill improvement centres in the scrapyards, long distance to known training centres and other opportunity costs. Among those who ever participated in skills improvement training, 86 percent said they could afford to pay the fees.

Finally, the survey found that there are other interest groups such as women and truck drivers who work in the scrapyards but are not members of GASDA.

Further Reading:

D. A. **Aladago**, A. **Batteiger** und R. W. **Afoblikame**, „Baseline Report: Environmentally sound disposal and recycling of e-waste in Ghana,“ 2018.

S. **Atiemo**, L. **Faabeluon**, A. **Manhart**, L. Nyaaba und T. Schleicher, „Baseline Assessment on E-waste Management in Ghana,“ *SDI, Sustainable Recycling Industries*, 2016.

Relevant Websites for Information:

Environmentally Sound Disposal and Recycling of E-waste in Ghana (E-Waste project)

<https://www.giz.de/en/worldwide/63039.html>

Sustainable Recycling Industries (Ghana)

<https://www.sustainable-recycling.org/recycling-initiatives/ghana/>

Ministry of Environment Science and Technology (MESTI)

<https://mesti.gov.gh>

Environmental Protection Agency

<http://www.epa.gov.gh/epa/>