



	<b>Country:</b> Ghana
	<b>Sector:</b> Integrated Waste Management Sector
	<b>Project:</b> Ghana e-Waste Model (GEMOD)
	<b>Grantee:</b> Environmental Protection Agency (EPA)

## Acknowledgements

The SWITCH Africa Green programme was developed by the European Commission to support African countries in their transition to an inclusive green economy, the main objective being to promote sustainable development. This is based on sustainable consumption and production (SCP) patterns, while generating growth, creating decent jobs and reducing poverty.

This impact sheet on Ghana e-Waste Model (GEMOD) provides a snapshot of results and achievements of the project under the Green Business Development Component of Phase I (2014-2019) of the SWITCH Africa Green programme. This component supported micro, small and medium-sized enterprises (MSMEs) to apply and adopt SCP practices in their business operations.

The project was implemented by the Environmental Protection Agency (EPA), with the support of the SWITCH Africa Green National Focal Point Lambert Faabeluon, EPA, Ghana; Ghana National Cleaner Production Centre (GNCPC) and National Coordinator Kingsley Bekoe Ansah, United Nations Development Programme (UNDP), Ghana. The grants were managed by United Nations Office for Project Services (UNOPS) and coordinated by Celia Marquez with support from Mercy Gatobu.

Supervision and coordination for development of the impact sheet was carried out by Rhoda Wachira and Patrick Mwesigye and programme support was provided by Carlyne Kilel and Sylvia Munuhe, Africa Office, United Nations Environment Programme (UNEP).

The impact sheet was compiled by Sheila Karue consultant, UNEP. Editing, layout and design was coordinated by Communication Division, UNEP.

UNEP is grateful for the financial support provided by the European Union (EU) for implementation of the SWITCH Africa Green programme.



## Background

The Ghana e-waste model project was implemented with support of the SWITCH Africa Green programme to promote sustainable and environmentally sound management of electrical and electronic waste (e-waste) in Ghana. Through the project, a framework for e-waste management was developed which transformed the challenges experienced in the sector into economic opportunities for the operators of e-waste in the formal and informal sectors.

With the usage of electrical and electronic equipment (EEE) on the rise, the amount of e-waste produced each day is growing enormously around the globe. In the collection of e-waste, about 79 per cent of the activities are dominated by the informal sector. The challenge is that the collection of e-waste is characterized by environmentally unsound practices. Primitive recycling techniques such as burning cables for retaining the inherent copper expose both adult and child workers, as well as their families, to a range of hazardous substances. e-Waste

plastics are bulky and take up a lot of space at scrap yards and refurbishing shops, they contain a lot of hazardous chemicals such as brominated flame retardants (BFRs) which release furans, dioxins, and other noxious substances into the atmosphere when they are burnt.

e-Waste also contains materials that have economic value when extracted. When proper extraction processes are used, e-waste can generate large volumes of these valuable elements which are able to be re-introduced into production streams. The GEMOD project aimed to address the challenges faced in e-waste collection - refurbishment, dismantling and sorting, safe disposal of hazardous components and export of recyclables. It was hoped this would provide a solution to the negative tag of unsustainable e-waste management in Ghana, with Agbogbloshie, in the vicinity of Old Fadama, being described as "The world's most polluted site".

The project commenced with a baseline assessment of the e-waste management framework

in Ghana to determine the feasibility of establishing an e-waste recycling facility.

## Beneficiaries

The project engaged MSMEs involved in e-waste collection, handling, sorting, dismantling, repair, refurbishing, and disposal.

## Objectives

- Develop a sustainable national e-waste management system which makes e-waste re-usable to minimize environmental pollution
- Build capacity of MSMEs involved in e-waste on sustainable management practices
- Support the establishment of e-waste collection and buy-back centres
- Contribute to creating an enabling national policy framework for sustainable e-waste management



## Outputs

- **Improved institutional coordination on economic, business and environmental policies**
- The EPA set up a hazardous waste unit under the Executive Director's Secretariat to coordinate hazardous waste activities, which includes waste electrical and electronic equipment (WEEE), national and transboundary transactions as well as licensing existing and start-up e-waste businesses.

---

### Over 200 institutions, corporations and local scavengers were formally registered to facilitate e-waste collection.

---

- Through the project over 200 institutions, corporations and local scavengers were formally registered to facilitate e-waste collection. Three scrap dealers' associations were formed

in the implementation of the project: Eastern Region Scrap Dealers Association (ERSDA) with a membership of 800, Brong Ahafo Scrap Dealers Association with a membership of 350 and the Tamale Scrap Dealers Association with a membership 250. This is an increase of 50 per cent in the number of associations in existence before the project.

- **Increased networking among green businesses**
- A web application linking e-waste collectors was developed. The GEMOD app, available at [www.ghanaewastemodel.com](http://www.ghanaewastemodel.com) creates links between the WEEE generator, trained WEEE collector, dismantler and recycler for sustainable e-waste management and environmental

---

### A web application linking e-waste collectors was developed.

---



sustainability. The application enables generators to place items for collection on the platform, allowing interested buyers to negotiate prices and make arrangements for delivery and collection.

- MSMEs engaged in the GEMOD project were linked with others working in the Industrial Symbiosis (IS) project . Waste plastic





from WEEE served as raw material for plastic recycling companies for the production of non-food grade products. The SWITCH Africa Green supported project *Promoting Biogas Technologies* collaborated with GEMOD to explore the possibility of using WEEE plastic to produce biodigesters.

- The GEMOD project

**Waste plastic from WEEE served as raw material for plastic recycling companies for the production of non-food grade products.**

collaborated with the sustainable recycling industries (SRI) project sponsored by the State Secretariat for Economic Affairs (SECO). They identified and sorted WEEE plastics and trained conformity assessment auditors for WEEE management in Ghana.



**25 e-waste collection and buy-back centres were established in the Greater Accra region to facilitate aggregation and transport to the recycling plants.**

- Establishment of collection centres

Through the project, 25 e-waste collection and buy-back centres were established in the Greater Accra region to facilitate aggregation and

**240 participants collection and buy-back centres were established in the Greater Accra region to facilitate aggregation and transport to the recycling plants.**



transport to the recycling plants. The centres made applications for environmental permits to ensure that their operations complied with provisions of environmental laws.

- **Improved capacities of workers in green sectors**

- 240 participants were trained on SCP in 4 workshops. The participants included informal e-waste collectors; recyclers; scavengers and dismantlers; scrap dealers; repairers and refurbishers of electronic gadgets. The trainees were equipped with skills to manage e-waste sustainably, create awareness on the adverse effects of current management practices and promote the no-burn policy – the legal framework for managing e-waste.
- A training curriculum and manual on sustainable e-waste management was developed. The EPA collaborated with the National Vocational Training Institute (NVTI) to finalize standardization of the skills-based curriculum

and training manual for the environmentally sound dismantling of WEEE for all handlers of electronic equipment.

## Outcomes

- **Contribute to national policy reforms on e-waste management**

Through project support, EPA contributed to national policy reforms on e-waste management by giving recommendations on sustainability in Ghana. They provided technical input into the Hazardous and Electronic Waste Control and Management Act, 2016 and Hazardous, Electronic and Other Waste Control and Management Regulations, 2016 (LI 2250).

- **Uptake of SCP practices by MSMEs**

- The MSMEs adopted SCP practices. They benefitted from training in the safe handling of e-waste using appropriate personal protective equipment (PPE) identification and segregation of various e-waste elements.



- Improved water efficiency through recirculating processed water used to wash plastics from lead acid batteries for reuse, leading to no-discharge of effluent and cost savings of 200 per cent per month on water use. Adoption of sustainable waste management practices such as the recovery, recycling and reuse of components, thereby moving resources





up the waste hierarchy. Recovered components were used in refurbishing and constructing new equipment. Recyclable plastics and toxic elements (ensuring appropriate storage) were retained. This kept the resources longer in the value chain, thus reducing the demand for virgin components (i.e. dematerialization).

## Impacts

### Environmental impacts

- **Reduction in virgin material footprint**

The use of components recovered from e-waste reduced the amount of new elements used in repairing existing equipment by 70 per cent. There was also a burgeoning demand for components of WEEE.

- **Reduction in waste**

By the end of the project period, 20,000Mt of e-waste from Accra, Kumasi and Koforidua had been recycled and sold to both local and export markets.

### Economic impacts

- **Net additional income of workers of MSMEs**

There was a 400 per cent increase in income reported by individual MSMEs. Labour costs were lowered as the enterprises moved away from burning e-waste. The sale of unoxidized copper wire fetched higher prices because it has better conductivity. New products from upcycling such

as, jewellery, garden furniture, art pieces and water hoses, created additional revenue.

### Social impacts

- **Reduction in air pollution**

Air pollution was reduced as a result of this project. WEEE was no longer burnt, instead an environmentally sound dismantling method was used, along with cable stripping, to recover valuable components. Components such as plastics, transformers, cables and hazardous material now had a use.

---

**WEEE was no longer burnt, instead an environmentally sound dismantling method was used.**

---

- **Occupational health and safety**

Occupational health and safety measures were introduced to collectors, dismantlers, transporters and final handlers of e-waste. Handlers were no longer exposed to toxic



fumes with the move from burning the waste. Instead they were provided with PPE for handling the harmful materials recovered, such as lead, cadmium, chromium, brominated flame retardants or polychlorinated biphenyls (PCBs). This resulted in improved health and safety.

### Involvement of youth



### A total of 240 youths were recruited and trained in e-waste collection, handling and management.

A total of 240 youths were recruited and trained in e-waste collection, handling and management. This resulted in improving their livelihoods as they would otherwise be involved in the unsustainable and unsafe scavenging of e-waste.

### Lessons learnt

- A concrete business case is needed for enterprises to buy-in to implementing SCP practices and thus green their businesses.
- There are opportunities to create new product lines from implementing SCP practices and consequently additional revenue streams for MSMEs. For instance, up-cycling businesses have emerged to play a significant part in the e-waste value chain management, leading to development of innovative products.
- Clear determination of the economic value of some of the e-waste components such as plastics promotes recycling, therefore reducing poor disposal practices.
- Integration of SCP practices in business operations has given MSMEs access to markets that demand sustainably produced raw materials.
- One solution does not fit all. To ensure acceptability and ownership of solutions and



guidelines consultation with relevant trade associations is necessary.



*“ Atlantic International Recycling Systems is now a training and buy-back center for sustainable e-waste management.”*

Owner,  
Atlantic International Recycling Systems.

*“The capacity building has helped us know that what use to be waste is actually a resource, my production capacity has increased, quality of jobs received have improved and the value of service rendered has appreciated.”*

Owner,  
Mystery Technologies.



[www.unep.org/switchafricagreen](http://www.unep.org/switchafricagreen)



Empowered lives.  
Resilient nations.



Funded by the European Union

Facebook:switchafricagreen  
Twitter:@switchafrica  
Email: info.switchafricagreen@un.org

Photo credits : UNEP|SWITCH Africa Green