Formal-informal sector interface models

GIZ E-Waste Programme Ghana

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1 Introduction

In support of the stakeholder process lead by the Ministry of Environment of Ghana (MESTI), this input paper describes formal-informal sector interface models, based on the examples of successful cooperation examples such as e[co]work, Coopertech and Desco electronic recyclers. The paper explains how the concept of collection centers could be operationalized in the Ghanaian context. It does so by analyzing formal-informal sector interface models against the opportunities offered by the Ghanaian situation, especially related to the Ghana Hazardous and Electronic Waste Control and Management Act 2016 (ACT 917) and the Ghanaian Technical Guidelines on Environmentally Sound E-waste Management for Collectors, Collection Centers, Transporters, Treatment Facilities and Final Disposal. Furthermore, it elaborates on the feasibility of using such interface models towards a (partial) formalization of the informal sector.

The aim of the input paper is to initiate a discussion amongst Ghanaian stakeholders on how to strengthen cooperation between formal recyclers and the informal sector.
2 Informal-informal sector interface models

2.1 DESCO electronic recyclers – South Africa

Overview

DESCO was the first e-waste recycler on the African continent, established in 1992 and currently the largest in South Africa. While the original goal was to recycle obsolete and redundant mainframes and general IT equipment, the company nowadays recycles diverse e-waste streams with a focus on printed circuit boards (PCBs).

Business model

Run as a family business, DESCO pioneered to incorporate informal workers into its business model. This is mainly done through on-site training, e.g. on environmental health and safety standards and through supporting ex-employees or individual informal/semi-formal waste dismantlers and collectors. As Desco carefully selects their sub-contractors and aims at establishing a healthy business-relationship based on trust, only the following persons are eligible to partner as a subcontractor with Desco:

- Long-term Desco employees who show a genuine interest in starting their own company, have learned the business and know how to responsibly handle e-waste. Once the employees started their own business, Desco provides start-up help in the form of pre-processed stock (containing no hazardous fractions) and starting capital (stock or e-waste).

- Suppliers that already sell their PCBs and other fractions to Desco for more than 1 year. Once a partnership is established, they must put down a deposit to take stock. The deposit is paid back once they sell back their dismantled fractions to Desco.

Once the selected employees or suppliers become formalized and independent business contractors, they then cooperate as a subcontractor with Desco.

Support provided by Desco includes administrative assistance, e.g. when registering their new companies and making them compliant with corporation and tax law so that they are a legally formalized business enterprise. Furthermore, Desco provides Personal Protective Equipment (PPE) and other equipment, such as dismantling tools and vehicles for transporting heavy equipment to their sites. In addition, Desco does not charge the subcontractors for the use of tools, vehicles and Desco premises.

The subcontractors have two income stream options:

- Desco sells pre-processed e-waste materials to the subcontractors who take the waste off-site, add value through dismantling and sell the fractions back to Desco, or

- Desco hires the subcontractor to provide labour. The material remains on-site and in the ownership of Desco but is dismantled or processed by the subcontractor.

Furthermore, the contractors are also hired when equipment needs to be dismantled at a client’s premises and subsequently loaded on trucks for transportation.

The e-waste that is outsourced to the subcontractors for dismantling includes printers without toners, photocopiers, plotters, telephones, cash registers, telex machines, calculators, household appliances like vacuum cleaners, toasters, coffee machines, radios, HiFi, etc.
DESCO partners are free to sell their purchased material streams (e.g. aluminium) or refurbishable parts to other buyers. This goes for all components and material streams with the exception of printed circuit boards, which all have to be sold back to Desco.

While this allowed DESC0 to outsource operations such as collection and manual dismantling, it ensures sufficient waste volumes for their core operations on printed circuit boards. At the same time, workers remain independent and manage their own businesses. As of 2020, 10 subcontractor businesses are working with Desco, whereby five workers remain on the premises and five are situated off-premises. Obviously both partners on and off the premises must fulfil all environmental health and safety, as well as social standards. In order to ensure this, Desco audits their off-site partners on a regular basis.

Desco is structured according to International Standards 9001, 14001 and OHSAS 18001 and is ISO 14001 compliant. The full business model is portrayed in figure 1, below.

**Figure 1: Overview of subcontractor cooperation to dismantle E-waste fractions in Desco’s business model**  
(Source: StEP, 2020)

**Legal and other supporting framework conditions**

The South African Broad Based Black Economic Empowerment (B-BBEE) Act came into force in 2003. The act aims at black economic empowerment (BEE) through the distribution of the nation’s wealth across all races and genders and is described as an “integrated and coherent socio-economic process that directly contributes to the economic transformation of South Africa and brings about significant increases in the numbers of black people that manage, own and control the country’s economy, as well as significant decreases in income inequalities (Republic of South Africa, 2007)”.
Desco’s informal-formal interface model is in support of the B-BBEE. Desco support Black Economic Empowerment through the inclusion of informal workers, the assistance in their pursuit to formalization and foundation of own companies. Hence Desco contributes to most of the five pillars of B-BBEE, which are:

- Ownership (Direct empowerment)
- Management Control (Indirect empowerment)
- Skills Development
- Enterprise Development
- Socio-Economic Development

While around 80% of Desco’s staff are black, 100% of the empowered entrepreneurs and former Desco staff are black. Since BEE is an important factor when it comes to tendering of both government and private industry contracts, Desco’s informal-formal sector interface model as well as the collaboration with the newly founded companies is an advantage for Desco as they gain points for their BEE scorecard and hence increase their chances of winning the tendering process. When tendering, the companies are classified by scoreboard-level

A company counts as non-compliant if the points are below 30 and as such no procurement recognition is availed to such.

In addition, the newly founded companies usually function at lower running costs than the one that Desco has. They can therefore collect e-waste in a larger regional radius, which ultimately also benefits Desco.

### 2.2 E[co]work – India

**Overview**

E[co]work is a start-up business that aims to bridge the gap between the well-established informal e-waste dismantlers in India and sound practices in a safe and professional environment, by providing co-working space for the e-waste recycling sector.

**Business model**

Since the company aims to hold the official license to conduct the business, it offers a physical working place for informal micro-entrepreneurs in line with legal requirements, hence reducing the risk of forced business closure for informals. At the same time, E[co]work is an independent company without competing business interests vis-à-vis the informal micro-entrepreneurs. By providing the opportunity for the micro-entrepreneurs to continue their work with legitimacy, E[co]work enables them to grow as eco-entrepreneurs, while preventing health hazards and environmental pollution.

Next to the physical infrastructure, whose layout always depends on the needs of the community and is defined in participatory processes, E[co]work also provides efficient machinery and tools, personal protective equipment, business support and community services. In addition, E[co]work also offers cost-optimization opportunities through different payment schemes and auxiliary services, e.g. access to finance, healthcare and training.

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1 More information on the score board levels can be found here: http://www.beescore.co.za/what-is-bee.html
In exchange for these services, the e-waste micro-entrepreneurs pay fees for the use of equipment, working- and storage place so that ultimately, E[co]work can be self-sustaining. In addition to the income generated through the provision of services to the micro-entrepreneurs, E[co]work also earns money through additional services offered to the broader public such as data provision or workshops and events.

Figure 2: Business model E[co]work (Source: E[co]work Association, 2020)

**Legal and other supporting framework conditions**

New e-waste management rules were introduced in India in 2016 (Government of India, 2016). They did not take the informal sector into consideration for the most part and forced micro-entrepreneurs to stay illegal. This is as only those who met strict criteria could be formalized or apply for an official license. However, these criteria are very high and almost impossible to meet by small-scale informal workers and micro-entrepreneurs. At the same time, demand for formally recycled e-waste in India is rising rapidly.

Since the criteria outlined in the e-waste management rules cannot be met by most informal workers, e.g. due to the required minimum size of the factory or the quantity of dismantled e-waste, this puts existential pressure on informal workers. This in turn leads to the popularity of the E[co]work model, as it can build a bridge between informality and formally recycled e-waste.

### 2.3 Coopertech – Brazil

**Overview**

Coopertech was founded in 2016 and is one of the first e-waste specialized cooperatives in Brazil. It aims at the reduction of informality, social inclusion, and promotion of adequate working conditions. The cooperative currently processes about 2 tons of e-waste per month, sourced from both e-waste specific waste streams and municipal solid waste.

**Business model**
Due to the cooperative model, Coopertech is a jointly owned enterprise with shared social and economic goals among members and shareholders.

In accordance with the Brazilian Law No. 5764/1971, the enterprises decision making is done during the general assembly. General management and planning are done by an administrative council or direction, whose members are elected at the general assembly. In addition, the management structure also comprises a fiscal council which deals with the fiscalization of the cooperative management and whose members are also elected at the general assembly.

To bridge the informal-formal gap, Coopertech trains and employs waste pickers and unemployed staff. They then receive a revenue proportional to monthly production.

To further raise awareness and strengthen the adequate management of e-waste management, Coopertech sets high value to health, safety and environmental protection. Coopertech also engages in environmental education such as free courses for the local community, e-waste collection campaigns, technical visits, and partnership with educational institutions. The cooperative also hosts an open EEE museum. These activities help to maximize e-waste input and hence, economic benefit.

Coopertech sources its e-waste from municipal special e-waste collection, e-waste sorted from the municipal recyclables scheme and e-waste campaigns, e.g. at churches, fairs and educational institutions. Access to municipal e-waste streams was ensured in 2017, when a partnership with the municipality was established. In addition, this enabled Coopertech to receive support for hazardous fractions disposal and to access municipality solid waste recyclables, which serves as a supporting business.

Once received, the waste is then stored and sorted. After that, the e-waste is - depending on its potential for re-use and its value - either refurbished and sold or donated, or dismantled (or stored respectively for low value fractions) and then sent for further treatment. Buyers include regional scrap dealers and recyclers as well as an official takeback recycler who purchases and processes both low-value WEEE and valuable fractions. To further increase its e-waste input, Coopertech is in the process of registering as an operator for the official e-waste takeback scheme aiming at receiving stocks directly through the official e-waste takeback scheme.

The full business model is shown in the following figure:
Figure 3: Overview of E-waste input streams, E-waste processing steps at the Coopertech unit and the E-waste output streams. (de Souza, 2020)

Legal and other supporting framework conditions

Under the Brazilian law No. 5764 (1971) cooperatives’ are defined as societies of people, with proper juridical nature and framework, of civil nature, not subject to bankruptcy, constituted to provide services to their associates.

Hereby, associates are signatories of the cooperative society contract (not employees). They are mutually obliged to contribute with goods and services, for the exercise on an economic activity, of common benefit, without the objective of profit and can only be excluded from the cooperative due to:

- Ending of the society
- Death
- Unattended civil incapacity
- Unattended statutory requisites of the cooperative

In Brazil, waste pickers’ cooperatives are stimulated by the law, more precisely the Brazilian National Solid Waste Policy (PNRS): Law 12305/2010. The policy aims at fostering cooperatives among different actors of the society and promoting more sustainable and eco efficient enterprises which recognize solid waste as an economic asset with social value.

In addition, cooperatives are supported by governments and society. In this regard, municipalities must prioritize cooperatives integration in recyclable municipal solid waste management, which gives cooperatives the opportunity to be formally integrated in municipal waste management plans. Municipal solid waste management plans must inform on the participation of cooperatives, and rules for contracting them. Also, cooperatives are allowed to participate in take-back schemes for special waste streams such as e-waste. In return municipalities that include cooperatives in recyclable municipal solid waste management get priority in federal funding. The government further stimulates the creation of cooperatives as it may create funding schemes to support implementation of infrastructure and equipment for cooperatives. Also, governments may concede tax of financial stimulus to projects involving cooperatives.
Another factor that stabilizes the e-waste sector in Brazil as a whole, while at the same time fostering cooperatives, is the 2019 sectorial agreement signed between EEE producers, importers, distributors, and retailers and the federal government. The agreement defines amongst others:

- Means, criteria and responsibilities for e-waste receipt, delivery and collection
- That e-waste appliances, while still assembled, are not treated as hazardous waste
- That municipalities and waste pickers’ cooperatives can be hired by a management entity, under all legal requisites, provided they have adequate documentation

3 Informal-formal sector interface models in the Ghanaian context

A key underlying general requirement for all three formal-informal interface models is trust. This mutual relationship of trust needs to be developed over time, and in some cases must also be verified by means of controls. Apart from this general requirement, the specific requirements to mirror each model to another context are described below.

**Mirroring the Desco model to another context**

Because the Desco model is strongly based on trust and any misconduct of the newly founded companies and contractors would fall back on the parent company, it is important to consistently demand and control the specified minimum standards when e.g. mirroring the Desco model to another context.

In order to manage this relationship of trust and at the same time guarantee smooth and profitable economic relations, it is advisable to deliver to the selected subcontractors only preprocessed e-waste. Special devices, such as data carriers or those containing hazardous fractions should be handled by the parent company and should not be delivered.

**Mirroring the E[co]work model to another context**

In order to transfer the E[co]work model to another context, similar aspects have to be considered. First and foremost, it is important to build a relationship of trust. Therefore, it is important to use existing structures and relationships in an optimal way and to adapt to, as well as interact with them.

Furthermore, incentives are often necessary to highlight the advantages of the model to the informal recyclers. Even if monetary aspects are undoubtedly one of the decisive factors, the incentives do not have to be monetary per se. Training, more efficient tools or ultimately health aspects can also be a persuasive factor.

**Mirroring the Coopertech model to another context**

From the perspective of an informal recycler wanting to enter an informal-formal partnership, it is important to adapt minimal forms of organization, e.g. by establishing associations or cooperatives. This is also a precondition to establish the Coopertech model in another country. Hence, if the formation of associations or cooperatives is not socially embedded or accepted, the model will be difficult to implement. Furthermore, the model relies on a favorable framework provided by the government, e.g. through fostering the creation and support of cooperations.
Generally, recyclers should comply to minimal standards outlined in the inform-formal partnership, e.g. relating to reporting and environmental requirements.

**Opportunities offered by the Ghanaian Situation**

In 2016 the government of Ghana adopted the Hazardous and Electronic Waste Control and Management Act 2016 (ACT 917), alongside the Legislative Instrument (LI 2250), which was developed to facilitate the implementation of the Act. The Act 917 is further substantiated in the ‘Technical Guidelines on Environmentally Sound E-waste Management for Collectors, Collection Centers, Transporters, Treatment Facilities and Final Disposal’, which were developed by the Environmental Protection Agency (EPA) of Ghana in collaboration with the Swiss financed Sustainable Recycling Industries Programme (EPA-SRI, 2018).

The Technical Guidelines include a five-tier approach which factors the needs for the different activities along the value chain. In addition, each tier sets different requirements and responsibilities for the respective partners and actors. The guidelines take into account the different levels of formalization and follow an incremental approach. Hence, requirements for being registered as a Tier 1 collector are significantly lower than the requirements for higher tiers (StEP, 2020). The tier approach is outlined in the figure below.

![Technical Guidelines](image)

**Figure 4:** Tiers and ambition level of requirements for different actors as outlined in the Ghana technical guidelines (Source: Schluep & Atiemo, 2019)

As currently, 95 % of the e-waste in Ghana is collected and later recycled by the informal sector, there is an urgent need for informal-formal partnership models. A framework for such partnerships and the corresponding conditions for collaboration is outlined by the technical guidelines. First pilot activities, such as the channeling from cables from the Old Fadama Scrapyard (where most of them were burned) to sustainable recycling based on a pilot payment and incentive system are implemented. However, the success of these informal-formal partnership models largely depends on the long-term availability of financial funds. One potential source for these funds could be the Ghana e-waste Eco-Levy.
Next to monetary incentives, the representatives from Desco and E[co]works stated that trust is crucial for functional informal-formal interface models. Through the longstanding continuous engagement of the GIZ e-waste programme in Ghana and the Sustainable Recycling Industries Programme, a good basis for such a trust-based collaboration was laid over the last years.

If sufficient financial funds and trustworthy relationships are present, all three of the above present models could be implemented in the Ghanaian context.

While the small-scale collectors could register for tier 1, the collection center mentioned in the three models could apply for a tier 2 license. They would then serve as aggregation point to receive e-waste collected by the (informal) scrap workers.

In all the presented models, the workers also engage in dismantling activities in the collection center. This activity is classified in tier 4. Nevertheless, according to the technical guidelines, some of the collection centers who fulfil the right pre-requisites regarding basic environmental health & safety (EH&S) protection can apply for a permit to engage in manual dismantling (incl. depollution) activities. Following both the business models presented above and the requirements outlined in the technical guidelines, the collected e-waste (respectively the manually processed fractions) would then be sent to licensed operators for further treatment. Further mechanical treatment of the fractions is only provided for in the Desco model, but according to the technical guidelines this must be carried out by a tier 4 company.
4 References

StEP focus group paper (2020): Case Studies and approaches to building partnerships between the informal and the formal sector for sustainable e-waste management.