Alternative Business Models

Towards creating safe and viable income opportunities for scrap workers (and their wider service support system) at Old Fadama (Agbogbloshie)

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

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Definitions

Child Labour	According to the International Labour Organisation (ILO) [1] "Child labour" is often defined as work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development. It refers to work that: • is mentally, physically, socially or morally dangerous and harmful to children; and • interferes with their schooling According to the ILO Convention C182 (1999) on Worst Forms of Child Labour and Convention C138 on Minimum Age Convention (1973) (which were the basis of the Ghana Children's Act of 1998), no child below 13 years shall work, and children between 13 and 17 can only do 'light work' as long as it does not threaten their health and safety, nor hinder their education or training and takes, generally, fewer than 14 hours per week.
Decent Work	According to the International Labour Organization (ILO), decent work is characterised by "decent opportunities for work that is productive and deliver a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that

[1] https://www.ilo.org/ipec/facts/lang--en/index.htm

	affect their lives and equality of opportunity and treatment for all women and men."[2].
Enterprise Development	Enterprise development is facilitated through support mechanisms and structures including but not limited to: • grants and loan access, • preferential credit terms, • seed capital provision, • preferential pricing/trade agreement structures, • mentorship and business skills training
Hazardous Work	'Hazardous work' refers to work in dangerous or unhealthy conditions which could result in illness, injury or death.
Subsistence Activities	Activities that can be found in both the formal and informal sectors, and which are conducted by economic operators who earn a wage that is barely sufficient to support or maintain themselves and which is below the minimum tax threshold required per national laws and regulations to pay taxes. (ISO IWA 19:2017 Guidance principles for the sustainable management of secondary metals)
Sustainable Livelihood	A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (British Department for International Development (DFID)).

[2] https://www.ilo.org/global/topics/decent-work/lang--en/index.htm

Glossary

AMA	Accra Municipal Assembly
AWPF	Agbogbloshie Worker Protection Fund
Bo2W	Best of 2 Worlds
EPA	Environmental Protection Agency
GASDA	Greater Accra Scrap Dealers Association
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ILO	International Labour Organisation
KfW	Kreditanstalt fuer Wiederaufbau
OHS	Occupational Health and Safety
EHS	Environmental Health and Safety
MESTI	Ministry for Environment, Science, Technology and Innovation
MoLGRD	Ministry of Local Government and Rural Development
MSME	Micro, Small and Medium Enterprises
NYA	Ghana National Youth Authority
PESTEL	External Factors: Political, Economic, Social, Technical, Environmental, Legal
SWOT	Strengths, Weaknesses, Opportunities, Threats
W2A	Waste to Art

Summary

This report is focussed on the development of feasible and practical alternative income opportunity business models to possibly benefit the wider scrap metal related recycling workforce operating in and around Agbogbloshie.

These described models in the format of stand-alone, generically developed "Character Briefs", hopefully aid the transition of some of the currently observed dangerous, hazardous and often exploitative activities towards safe and sound practices instead that are both socially and environmentally acceptable and therefore also legally compliant and politically supported.

The Historical Background section provides the existing legal background for (e)-waste management in Ghana and builds a common understanding of what an "alternative income opportunity" constitutes from the perspective of international minimum labour conditions as specified by ILO. It then describes elements of the Ghana informal work force and their distinct roles and responsibilities in both the e-waste service and/or value chain, as these parties constitute the "target group" at large meant to benefit from any of the alternative income opportunities described.

A short summary of desktop research in Chapter 2 unpacks the current drivers of Ghana's informal workforce and describes some of the historical approaches to business that were tried and tested (more or less successfully) to effect meaningful and safe informal sector workforce involvement in an otherwise formal economic business framework.

Chapter 3 unpacks the chosen Methodology elements upon which each "Character Brief" is built on. This includes the five distinct types of options chosen to cluster the Character Briefs namely:

- Organisationally-Based
- Value Chain-Based
- Activity- Based
- Operations/Technology- Based
- Alternative Material Stream-Based

as well as the PESTEL inspired "external evaluation" criteria to assess acceptability and the framework chosen to rank and compare (available vs required) the internal capacities and capabilities of the identified target group to positively respond to the proposed business model.

Chapter 4 provides a comprehensive summary table listing all Character Briefs that are further all attached in the Appendix in a detailed, standardised 4-page format including for each business model

- Background and Description
- SWOT Analysis
- Business Model Overview and Key of Symbols

Chapter 5 then provides the key conclusions and further recommendation on next steps required to bring some of these suggested alternative income opportunity business models to life.

1 Introduction

1.1 Historical Background

Various international development cooperation projects were launched in Ghana in the past with the aim to improve the prevalent e-waste management situation. This included extensive research for alternative, financially viable and EHS sound business models in order to optimise working conditions for all stakeholders in the Ghanaian value chain. To this end trialling of varying promising business models in a pilot project format took place in the last decade, mostly with a focus on improving the lives of economic operators linked to typical subsistence activities such as typically executed by "scrap workers".

After a first investigation conducted by Greenpeace in 2008 (which clearly pointed the untenable situation regarding the prevailing working conditions , unsound practices applied by a rapidly growing number of e-waste "recyclers" and the resulting disastrous consequences for the receiving environment), other research initiatives were subsequently undertaken including (but not limited to) the "Basel Convention e-Waste Africa project", the German funded "Best of Two Worlds" project, activities funded by the Nordic Fund and Pure Earth and the Swiss funded Sustainable Recycling Industries (SRI) project.

1.1.1 Legal Framework and Proposed Infrastructural Developments

Taking cognizance of the various concerning research project outcomes and findings so far [3], the Ghanaian Government has already recognised the many potential EHS related dangers that are intrinsically linked to unsound e-waste management treatment practices. To this end a first draft of a "Hazardous and Electronic Waste Control Bill" was developed in 2013 and in 2016 the Government officially adopted the Hazardous and Electronic Waste Control and Management Act 2016 (ACT 917), thereby passing the Legal Instrument (L.I.) 2250- concerned with "The Hazardous, Electronic and Other Waste Control and Management Regulations". The Act, marks the recent initiation of two key provisions of Act 917, which according to an internet article [4] are seen as being critical to the successful implementation of this new Law.

- The designation of the external service provider, i.e. SGS, to verify, assess and collect the Advance Recycle Eco Fee on all electrical and electronic equipment, under the Fifth Schedule of Act 917, imported from all exporting countries.

[3] Most recently the Persistent Organic Pollutants (POPs) Elimination Network, have discovered toxins in food and soil samples from Agbogbloshie https://ipen.org/documents/pops-eggs-report-africa

[4] https://www.myjoyonline.com/news/2018/August-29th/govt-to-build-e-waste-recycling-facility-in-agbogbloshie.php

- The establishment of a state-of-the-art recycling facility to be constructed at Agbogbloshie, in fulfilment of section 31 of Act 917

Figure 1: Model of the Proposed National e-Waste Recycling Facility (Source: www.myjoyonline.com)

The internet article further states that the presidential intention is not to have this facility built as a stand-alone entity but as an *"integral part of a network of newly established collection centres believed to create "over 22 000 self-sustaining jobs for the Ghanaian youth"* inter alia through a "fund"[5] that will "offer incentives for collection, transportation and disposal of electrical waste, and promote public education on the safe disposal of electrical and electronic waste and negative effects of electronic waste".

These recent measures and plans set the background for a new and innovative strategy towards a sustainable management of e-waste in Ghana. In addition on 15th February 2018, the Ministry of Environment, Science, Technology (MESTI) and the Environmental Protection Agency (EPA) officially launched the Technical Guidelines on Environmentally Sound E-Waste Management (supported by the Swiss-funded SRI-project under the lead of the Ghana Cleaner Production Centre, the Oeko-Institut, the World Resources Forum and Empa) that provides the required insight on how to practically proceed with the development of the required EHS working standards for all aspects of e-waste management.

It is with this background that the GIZ (commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ)) started a project in 2016 (to run until 2020) concerned with the "*environmentally sound disposal and recycling of e-waste in Ghana*". A specific emphasis in the GIZ project is to open up new legally compliant, occupational avenues for informal recyclers. To this end the Work Package 2.2 of the assignment seeks to first develop and then identify (and for the GIZ later to test) suitable business models for alternative income opportunities.

[5] It is assumed that this fund would be derived from and financed through part of the raised Advanced Recycle Eco Fee

1.1.2 Defining "Alternative Income Opportunities"

1.1.2.1 Current Work Income Scenario

In order to fully understand the nature and potential scope of "alternative income opportunity" options (as described in detail via the various character briefs included in chapter 4), it is important to define first the characteristic indicators for the quality, security and equity levels associated to the prevailing working conditions for the average Agbogbloshie situated informally operating scrap worker.

Typically, such an individual operates as an integral element in an informally operated, organically growing and functioning scrapyard (such as Agbogbloshie in Old Fadama) and is part of a largely unskilled male workforce, often originating from the rural North of Ghana. Mostly such individuals are youth/young adults of Islamic faith- in some cases even still children.

The current work environment of informal scrap workers in Accra is largely signified by earning subsistence activity/low level based incomes (either form of salaries from scrap business owners who employ them or by selling their workforce for service related activities directly[6]). However, compared to the money earning levels and occupational opportunities offered in their places of origin- both the income levels and choices to find paid work are significantly higher.

Unfortunately, many of the current income activities and options for the informal scrap workers at Agbogbloshie and other Ghanaian scrap yards are often directly linked to poor (occupationally unsafe and environmentally unsound) working conditions and resulting severe EH&S risks, unregulated requirement for overtime work, and irregular patterns of employment e.g. based on seasonal demand.

The working environment of Ghanaian scrap workers is defined by gender-based stereotyping (women are not commonly found in any aspect of managing metal scrap) and general exploitation of any available work force. The gross violation of basic worker rights (e.g. as described as one of the five objectives in the Guidance Principles to address deliver on and improve upon[7]) is signified by the absence of most basic physical worker protection measures, the lack of any other standard employment benefits (e.g. sick leave, holiday pay, medical aid etc.) and occasionally even extending into severe cases of child labour violation. Due to the informal nature of their income source, the scrap workers are also typically excluded from any form of collective bargaining (with the exception of having access to (not always financially and legally sound) susu collection[8] schemes and some

[6] "Burner boys" are typically operating as paid service providers to burn cables and recover copper for dismantling shops. As such they are running their own "businesses"

[7] (SRI Roundtable International Workshop, 2017)

[8] Susu collectors are a traditional form of financial intermediaries in Africa, predominantly in Ghana. For a small fee they provide an informal means for Ghanaians to securely save and access their own money, and gain some limited

localised micro-credit options). Therefore, they are hardly afforded any chance for growth, skill advancement or promotion that can lead them to a better paid and/or safer working environment.

1.1.2.2 Alternative Income Opportunities

On the contrary, any of the "alternative income opportunities" described further in this report fulfil the requirements as specified for "decent work" (see also Glossary). As such an income opportunity that is considered to be a viable "alternative" to a scrap worker's current work income scenario is characterised by containing these minimum work condition requirements (in compliance with the ILO definition elements on which also the delivery objective 1 of the Guidance Principles[9] is largely based upon):

- Work that is productive and meaningful
- Work that delivers a fair income[10]
- Work that offers security in the workplace from an OHS perspective
- Work that offers basic worker's right security/acknowledgement in the workplace
- Work that ensures equality of opportunity e.g. regarding gender and protects minorities

In addition, the alternative income opportunities under discussion need to show that they can deliver on the triple-bottomline sustainability considerations as defined under **Error! Reference source not found.**).

1.2 Project Motivation, Core Objectives for the Deliverables and Envisaged Outcomes

The key motivation for the development of effective and feasible business model ideas (linked to the development of alternative income opportunities) is the ability for Ghanaian Government authorities to enforce any of their e-waste related (and relatively new) regulations and technical guidelines (as described under 1.1.1). It is submitted, as a key objective of this research, that any future law enforcement drive (as well as the planned set-up and operation of a Government funded e-waste recycling facility) will be conducted in an integrated and inclusive manner regarding the current scrap worker force plus the intermediate support system services they rely on.

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access to credit, a form of microfinance. Money looked after for an individual by a Susu collector is held in a Susu account (https://en.wikipedia.org/wiki/Susu_collectors)

[9] (SRI Roundtable International Workshop, 2017)

[10] Such income can either be derived in form of a "salary" in a traditional employment scenario or earned through self-employment based entrepreneurial activities e.g. stimulated as part of an MSME type enterprise development programme. Note: Many individuals in the scrap metal service chain earn considerable amounts of money through their activities (e.g. acting as middlemen for trading fractions) while others are often financially exploited by the former as they operate in lower rank activities (e.g. burning cables or providing other third party services).

There needs to be assurance that scrap workers, who are currently involved in (or indirectly support [11]) unsustainable activities and hazardous aspects of e-waste management, are able to switch/transition into safer occupational areas and do NOT just lose their current income source without any alternative options available or get simply edged out by legally compliant formal sector representatives from their currently largely unregulated working environments.

The envisaged outcome of this research is therefore to find alternative income opportunities (with the minimum working condition requirements as defined under 1.1.2.2) that can make the target group individuals part of a safer and more innovative operational work force in and around[12] the scrap yard.

1.2.1 Defining "Scrap workers and their current service support systems"

Corresponding to the existing Ghanaian work force involved in various aspects of scrap metal recycling, distinct types of scrap workers can be defined according to the work activities they specialise in, the roles and responsibilities they assume and the rank they are afforded in either the service chain and/or the value chain (see Anne Scheinberg definition source) for e-waste and other scrap metals[13]. The position these parties assume is predominantly determined by factors such as principle access to the target materials, level of education, specialist technical skills and financial power and general business savviness as well as any other "human skills" related assets as described under 3.4.2.

Informal sector based waste services are typically centred around the following activity areas:

- Reclamation and collection of value items
- Reuse of salvaged functional components
- Recovery and sale of salvaged value fractions
- Development of new products made up of functional components and/or recovered value fractions

The following list of stakeholders which are potentially set to benefit from the introduction of some of the suggested alternative income opportunities (and for which all the related GIZ training programme efforts are directed at) include (but are not limited) to:

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[11] Indirect support services are provided e.g. by women selling food and water to these informal scrap metal recyclers.

[12] Income opportunities need to be found that are not endangering personal life and/or the health and integrity of surrounding communities and natural environments.

[13] According to Scheinberg et.al "interventions in relation to e-waste…are often defined as value-chain based but on closer investigation, they prove to be more motivated by service chain considerations as they seek to reduce pollution, restrict contamination, or protect public health from toxic or hazardous chemicals". http://www.wiego.org/sites/default/files/publications/files/Valuing-Informal-Integration-GIZ-2015.pdf

- Collectors
- Collection Points for Aggregation
- Repairers/Refurbishers
- Dismantlers[14] (for both functional components harvesting and for materials recovery purposes)
- Artisans/Upcyclers
- Traders (of both value fractions and functional components)
- Shop Owners (housing repair, dismantling service providers and selling components)
- Specialised Third Party Treatment Services (cable processors[15] or push cart lenders)
- Localised Support Services (water sellers, food vendors, push cart lenders etc.)

2 Sources of Report Information

2.1 Desktop Research Findings

The following sub-chapters describe literature findings from various, duly referenced literature sources that unpack the key drivers and causes of the current informal economy related to Ghana's e-waste activities. According to the International Journal of Environmental Research and Public Health (2017) [16] the latter generate in Ghana US$105–268 million annually and sustain the livelihoods of at least 200,000 people nationwide whereas the Agbogbloshie site alone provides livelihood opportunities of various sorts to approximately 4500–6000 workers and perhaps another 1500 indirectly. Internal research done by the GIZ (Batteiger; 2015) confirms from the latter report a total of 4000 scrap workers and 2000 collectors but estimates the number of individuals (from the informal sector and linked to either the service chain and/or value chain) to be much higher sitting at around 20 000 individuals.

This literature research furthers defines the scope and measures required to ensure that safe working conditions are introduced into any future informal sector activities and describe the idea behind some alternative business models that were already tried in the last decade in different countries to improve on the status quo.

2.1.1 Current Drivers of the Informal Economy

In order to identify business ideas for alternative income options that are likely to succeed (by being both financially feasible and effective) in the prevailing Ghanaian e-waste management landscape, it is important to determine the core reasons and subsequent drivers for the current rapid growth of dangerously operating informal[17] scrap workers at Agbogbloshie.

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[14] Dismantlers often specialise in one particular type of WEEE (fridges, ICT) or ELVs

[15] Cable processing could be in form of granulation or burning offered as a specialised and therefore outsourced service

[16] (Daum K., Stoler J., Grant J.R., 2017)

[17] Informal operations are driven by both subsistence activities motivated economic operators (the poorest of the poor who conduct dangerous practices to secure funds to survive) as well as individuals and businesses that would

To this end some findings from a research study conducted by the International Labour Organisation (ILO) in 2014[18] are taken into account for the identification of the key drivers and summarized below:

- Consumers[19] are unfamiliar with the concept of returning end-of-life EEE and paying for its proper[20] disposal[21]
- As for other developing countries, Ghana has not yet any effective take-back programmes for WEEE or outdated/unused equipment in place.
- For industrialized countries, there are still clear economic incentives to export e-waste to Ghana since the costs of treating e-waste "at home" (where subjected to strict environmental control and OSH regulations), are significantly higher[22].
- Despite official legislative restrictions now in place (Hazardous and Electronic Waste Control and Management Act, Act 917 (2016)), Ghana still receives large quantities of e-waste imports brought in unspecified and/or falsely declared as second-hand devices or with a very short remaining useful life-span.
- Up to now funding and investment[23] in formal e-waste recycling systems at the local level was poor.
- Historically lax implementation of e-waste regulations has enabled the informal economy to grow in particular in the field of repair, refurbishment and recovery (e.g. also known as "component harvesting") and trade of valuable secondary raw materials derived from e-waste.
- The entry level for informal workers is signified by obtaining relatively high profits and low investment costs to participate
- Materials recovered from e-waste are typically significantly more profitable than the conventional recyclables from solid waste.
- The informal e-waste "recycling" trade has low entry barriers and is accessible to non-skilled workers as well.[24]

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be defined as "unofficial business activity" type of economic operators according to the SRI Guidance Principles for Sustainable Management of Secondary Metals.

[18] (International Labour Organisation, 2014)

[19] The type of consumer can be either coming from the public (e.g. government facilities) or the private (businesses and household) sector

[20] As in sound regarding any resulting EH&S impacts

[21] On the contrary- the perceived wastes are of value and therefore payment or at least some other "in kind" reward is widely expected

[22] According to the United Nations Environment Programme however 85 % of the e-waste dumped in Ghana and other parts of West Africa is produced in Ghana and West Africa (https://www.smithsonianmag.com/science-nature/burning-truth-behind-e-waste-dump-africa-180957597/#ssb4uikE4IGfe4C3.99)

[23] This applies to both the public (government) and private sector (recycling businesses) sources

[24] albeit initially on entry level where the most concerning EH&S violations are generally observed linked to the crude practices applied and as outlined in the Worst Practices factsheets and with large income disparities (e.g. informal scrap shops workers compared to an informal workshop owner).

2.1.2 Scope for Safe and Efficient Working Involvement of the Informal Sector

Next to typical "collection" activities (collection, transport and sorting) some members of the informal sector in Ghana (similar to other countries) area also actively involved in repair, refurbishment, disassembly, re-assembly, part storage & sales (to supply repairers), and pre-processing activities. All of these activities are signified by low investment cost requirements which explains why these activities are most popular in the informal sector.

Provided the required basic tools and facilities are in place for such "function and/or material" recovering treatment activities, these can be generally conducted in a sufficiently safe and efficient manner. Actually it is submitted that in a 2009 UNEP research study that "a balanced combination of manual, semi-manual and mechanical dismantling and pre-processing, appropriate to the different types of e-waste, can bring economic, environmental and social benefits, including employment creation[25]".

Therefore, the technical scope for the identification and development of viable business cases for informal sector involvement should cover any aspect in these areas. The latter includes that adequate technology is provided and workers are properly trained and knowledgeable on potential hazardous impacts and how to protect themselves. The recently published SRI Factsheets[26] provide valuable information on the type of "worst practices" that can be fairly easily changed to good practices instead. It however also points out current prevailing practices (linked to uncontrolled treatment and disposal activities) that are NOT acceptable in the first place when conducted by the informal sector (due to the extra-ordinary and non-mitigatable danger and pollution potential). Such practices include e.g. any form of burning, metallurgical extraction treatments or open dumping.

The line for allowing any informal sector involvement needs therefore to be clearly defined and legally drawn when informal workers are confronted with the recovery of any fractions that warrant further "selective treatment" in any form and as further defined in the Ghana Technical Guidelines[27] and when entering the end-processing phase for WEEE recovery (either for valuable materials extraction or end treatment of the non-viable fractions contained). Treatment at material end-use recovery level does require large investments, infrastructure, innovative technology and a relatively skilled workforce, and must comply with strict controls and the licensing of formal businesses.

2.1.3 Historical Business Models

Informal sector integration, upliftment and poverty alleviation (all signified by the creation of dignified and EH&S sound "sustainable livelihoods") is one of the core objectives behind any "development aid" oriented programme. Many examples exist where despite the best of intentions

[25] (Schluep, 2009)
[26] (Sustainable Recycling Industries, 2018)
[27] (Sampson, 2018)

little was achieved that could sustain beyond original interventions facilitated through funding of both training programme and infrastructural set-ups.

2.1.3.1 "White Elephant Technology Gifts"

The African continent's "human and technical" development history is littered with examples where unfeasible types of technologies get pushed into a country (typically via government officials in on the trade) and through its (overseas company based) sellers- packaged as nothing less than a "generous gift" with minimal obligations attached. Sellers are often applying a "top to bottom" (let me tell you how it is done…) communication and subsequent implementation style. Such technologies which are often outdated already in the originating countries and sometimes even deliberately falsely marketed -without any local context being established first- are then sold as the panacea to solve "the African waste problem" and "create many jobs". Unfortunately, many of these technologies and plants end up in a dysfunctional state as "white elephants" after a very short time. Matter of fact, the recipients of "white elephant gifts" sometimes even ended up worse off and are stuck with crippling payback obligations for non-functioning technologies that prove to be not suitable for the problem at hand in the first place. As such any technology under consideration for implementation needs to be evaluated according to it being "appropriate" for the socio-economic and cultural conditions at hand next to its viability regarding the required quality and quantity of feedstock, local maintenance set-up etc.

The summary below provides some of the business idea approaches and subsequent project developments from research/ development aid agencies in the wider "sustainable livelihood" arena, who were well aware of such potential pitfalls and went to great length to avoid them.

2.1.3.2 Old for New Programme

Launched in 2011, the programme which originated in China offers subsidies along the entire value chain starting with encouraging consumers to return old equipment when buying new one with a subsidy. Subsidies are also offered for formal collectors and WEEE recycling facilities in an attempt to make those more competitive when pitched against any informal sector operations. The latter typically have an unfair financial advantage by cutting costs through deliberately avoiding precautionary measures that need to be taken in order to ensure safe and environmentally sound management of WEEE. Informal sector representatives are instead often found to merely cherry-pick out value fractions with no further attention given to any other materials and with toxic components and materials routinely either mismanaged or simply neglected.

Since 2011, the number of formal WEEE recycling enterprises registered with China's Ministry of Ecology and Environment (MEE) has grown from 36 in 2012 to 109 in 2017[28]

[28] http://www3.weforum.org/docs/Recovery_Key_Metals_Electronics_light.pdf

2.1.3.3 Best of Two Worlds (Bo2W) Programme

This philosophy for a new type of "business and trading model" was jointly developed by the United Nations University (UNU), Delft University of Technology, Umicore Precious Metals Refining and The Swiss Federal Laboratories for Materials Science and Technology (EMPA) and put into practice by the Oekoinstitut in 2012 and also by Worldloop.

The approach is based on the creation of a complete recycling chain for all materials which incorporates both capabilities and capacities of first world and emerging economies.

Under consideration of the minimum ILO working conditions required for any informal work sector involvement (1.1.2.2), it supports "the possibility of combining treatment processes that are competitive in developing countries (pre-processing phase, manual dismantling) with treatment processes that are more competitive, and can be safely executed in a regulated environment in industrialized countries (end-processing phase).

According to the ILO report summary[29] the Bo2W programmes were designed so " that informal workers could benefit from the formalizing of enterprises, following decent work and environmental guidelines, and interacting directly with recycling companies". Access to markets could be also improved and thus incomes could increase at the lower end of the e-waste chain, while also addressing unemployment in both cities and countries.

3 Methodology

3.1 Motivation for Chosen Methodology

The client brief for the development of alternative business models was to create them in a format that lends itself to workshopping them in a systematic manner with any of the clearly identified stakeholders they are targeted at. This request warranted the consideration that a classification methodology must be chosen for the models (that need to be all part of the Ghanaian e-waste management and value chain) that can distinguish clearly between their intrinsic characteristics while enabling their subsequent clustering into models with a similar approach to the required intervention and innovation.

Also, a considerable effort was made to ensure a generic and comparable layout for each of the business models (presented in chapter 4) in a highly visual and standardized "character brief" format. The chosen format as part of the Methodology comprises of the following elements:

- Background section (highlighting the history/motivation) for the proposed model
- Description of the core elements and strategies the idea is built on and some of the key stakeholders required

[29] (International Labour Organisation, 2014)

- Description of the exact target group set to benefit from the proposed idea
- PESTEL inspired business idea analysis (see also 3.4) providing an at-a-glance- view on external environment indicators to assess the expected "buy-in" potential
- Target group "basic skills" availability vs requirement evaluation graph
- A comprehensive one page SWOT analysis
- An at-a-glance one page business model overview complete with key resource flows (in form of knowledge, finances, skills, exposure etc.) and based on examples from the Board of Innovation business blocks[30]
- Key of symbols used in the business model overview and explained

Further on, in close collaboration with the client five distinct types of "alternative income opportunity business model" options could be defined and are further described in detail under 3.3.

While some of them are based on the introduction of organisational changes of parties in an expanded (informal sector inclusive) service and/or value chain[31], others are developed by proposing changed activities, alternative technologies and/or shifting the focus on recovering and repurposing alternative materials streams (e.g. as part of a range of new and innovative products locally developed) and as an alternative to the traditional scrap metal recovery activities.

Finally, it was requested that the methodology chosen to outline each of the alternative business models can ensure that any ideas described for the investigation of alternative income and employment opportunities are both financially feasible and ultimately sustainable (in other words- intrinsically independent of any ongoing external funding and support sources as currently provided by the GIZ and other development agencies).

To fulfil this requirement all of the business model ideas (except for the one that describes the proposed establishment of an Agbogbloshie Workers Protection Fund (AWPF)) are stand- alone concepts but their benefits are clearly multiplied when they run in close conjunction with each other.

3.2 Key Elements in the Local E-waste Recycling Chain

The potential measures to effectively and structurally create alternative income opportunities in both the scrap metal (including e-waste) related recycling chain should be a multi-stakeholder based process. Therefore, the next sections provide firstly a more detailed description of a generic value chain followed by as well the local (and even international) stakeholders involved in making up the Ghanaian one.

[30] https://www.boardofinnovation.com/
[31] (Scheinberg A., Savain R., 2015)

3.2.1 The Generic E-waste Recycling Chain

A generic e-waste recycling value chain, as presented in the ILO 2014 report[32] and described further under Figure 2 comprises of many different stakeholders that form an integral aspect and linkage of the overall life cycle (pre-consumer, consumer or post-consumer level) of any electronic or electrical devices.

Each of the distinct phases described in this generic chain namely:

- Generation and stockpiling
- Collection
- Treatment
- Output

offers a leverage point for the development of business models that are feasible and can be tailor-made for the Ghanaian context.

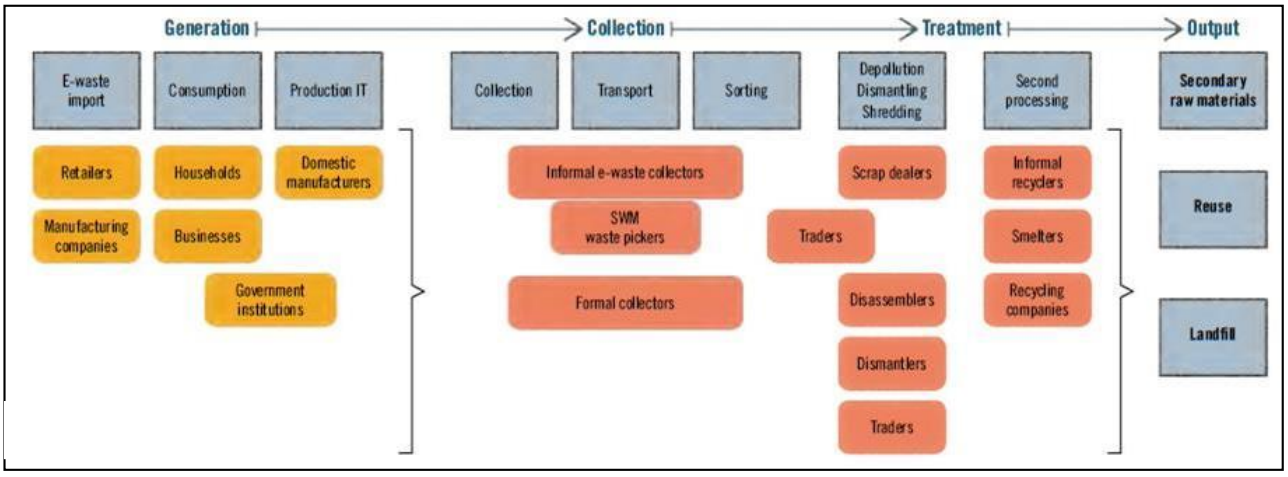

Figure 2: Stakeholders in the various stages of a generic e-waste value chain

3.2.2 Ghana's Identified E-waste Management Stakeholders

In accordance to the type of stakeholders that belong to any generic recycling chain, the following key stakeholders specific to Agbogbloshie have been identified and are described further below (based on their relevance to effect some of the (alternative) business model strategies outlined and evaluated as character briefs in chapter 4).

[32] (International Labour Organisation, 2014)

3.2.2.1 National Government (Ghana)

The inter-linked two driving forces in the Ghana Government to support various aspects of the GIZ Ghana e-waste project (see also under 3.2.2.3.1) are the Environmental Protection Agency (EPA) and the wider Ministry of Environment, Science Technology and Innovation (MESTI) of which the EPA is a part (agency) of.

3.2.2.1.1 EPA

EPA is dedicated to continuously improving and conserving the country's environment. It functions as regulatory body and catalyst for change towards sound environmental stewardship and oversees the implementation of the National Environment Policy in Ghana. Moreover, the EPA's mission is to co-manage, protect and enhance the country's environment as well as to seek common solutions to global environmental problems[33].

3.2.2.1.2 MESTI

MESTI exists to establish a strong national scientific and technological base for accelerated sustainable development of the country to enhance the quality of life for all. The overall objective of MESTI is to ensure accelerated socio-economic development of the nation through the formulation of sound policies and a regulatory frame work to promote the use of appropriate environmentally friend, scientific and technological practices and techniques[34].

3.2.2.1.3 National Youth Authority

The National Youth Authority is an agency under the Ministry of Youth and Sports[35]. The National Youth Authority (NYA) formally National Youth Council (NYC) is a statutory body established by the Government of Ghana in 1974 by NRCD 241 to co-ordinate and facilitate youth development activities in the country[36]. Much of the land in and around Agbogbloshie is owned by the NYA.

3.2.2.2 Local Government (Ghana)

3.2.2.2.1 Accra Municipal Assembly (AMA) Waste Management Department

The Waste Management Department is responsible for the provision of facilities, infrastructure Services and programmes for effective and efficient waste management for the improvement in environmental sanitation, the protection of the environment and the promotion of public health. http://www.ama.gov.gh/

3.2.2.2.2 Ministry of Local Government and Rural Development (MoLGRD)

The Ministry of Local Government and Rural Development exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana to ensure good governance and balanced rural based development. http://www.mlgrd.gov.gh/

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[33] https://ghana-nrw.info/en/environmental-protection-agency-ghana-2/
[34] https://ghana-nrw.info/en/ghanaian-ministry-of-environment-and-science-2/
[35] https://www.nya.gov.gh/
[36] https://en.wikipedia.org/wiki/National_Youth_Authority_(Ghana)

3.2.2.3 Foreign Government Supported Organisations

3.2.2.3.1 GIZ

GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security. Its main commissioning party is the German Federal Ministry for Economic Cooperation and Development (BMZ). In Ghana the GIZ runs for the period 2016-2020 a project entitled "Environmentally Sound Disposal and Recycling of E-waste in Ghana (E-Waste project)". As such the GIZ is helping MESTI to improve the wider framework for sustainable e-waste management including:

- the policy framework for sustainable management of e-waste at macro level.
- economically viable business models at meso level.
- kick-starting and promoting a sustainable e-waste recycling sector.[37]

Capacity development of informal sector players at micro level is directed at making e-waste management more sustainable and less damaging to the environment and the population's health while Government capacity services rendered for MESTI and EPA focus predominantly on setting up a system of extended manufacturer's responsibility.

3.2.2.3.2 KfW

The German KfW Development Bank currently focuses on three areas in Ghana, namely agriculture, sustainable economic development, and governance. In addition, KfW helps the Government of Ghana to improve public financial management[38]. Beyond the focal areas KfW finances (renewable) energy-sector projects and this GIZ driven e-waste programme (as part of the „financial cooperation project") which is jointly implemented by MESTI and KfW.

3.2.2.4 Other Key Stakeholders

3.2.2.4.1 GASDA (Greater Accra Scrap Association)

Most people who work on a significant scale with scrap metal (including e-waste) and are concerned with any of the key activities described under 1.2.1 are organized by the Greater Accra Scrap Dealers Association.

3.2.2.4.2 The Impact Hub and other Innovation Hubs

As a type of Innovation Hub the Impact Hub Accra is a co-working space located in Accra, Ghana and linked with other Impact Hubs globally through the Africa Seed Program. https://accra.impacthub.net/

3.3 Distinct Types of "Alternative Income Opportunity" Options

As mentioned above already- the attached, proposed alternative business ideas which are all designed in a generic and therefore directly comparable "character brief" format (provided in an

[37] https://www.giz.de/en/worldwide/63039.html
[38] https://accra.diplo.de/gh-en/botschaft/themen/politik/mittler-kfw/1097528

overview table in Chapter 4 and attached individually in the Appendix) can be divided up into 5 distinct types the way they effect and affect the envisaged outcomes. By their very nature they can be described to be based on change, suggested alternatives or interventions that are either:

- Organisationally Based
- Service and/or Value Chain Based[39]
- Activity Based
- Operations/Technology Change Based
- Alternative Material Stream Based[40]

The pictograms used to distinguish the type of alternative business models discussed in this report (and excluding the Alternative Material Stream based approach) is shown in the figure below. This symbol key is used on the start of each brief to indicate the association of the described model to the cluster type.

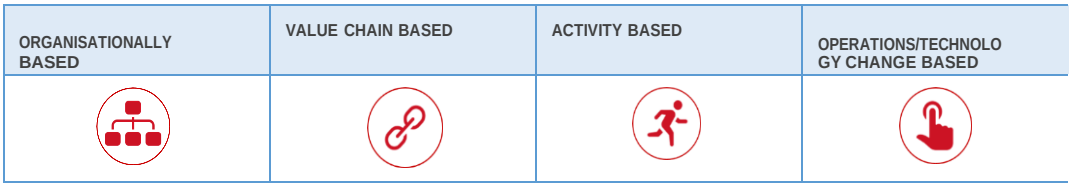


Figure 3: Pictograms for the various type of alternative business models under discussion.

The section below describes in more detail the nature of these chosen clusters where a marked change in the current approach is hoped to make a difference between the current modus operandi and the suggested alternative income opportunity option described.

3.3.1 Organisationally Based

This cluster houses alternative business ideas that are based on any proposed organisational restructuring changes. E.g. the introduction of an Agbogbloshie Workers Protection Fund as well as the proposed development of a Collectors cooperative directly supported by an Alliance of formal recyclers would warrant the description of alternative business models that are by their nature "organisationally based".

[39] It is noted that a distinction in definition is made between serve chain and value chain by some leading researchers (A. Scheinberg) but for the sake of the character briefs it is understood that either options are grouped under "value chain based".

[40] Alternative Material Stream Based income opportunities are listed for the sake of completeness but are not further discussed in this report since they have been researched and subsequently workshopped through a different work stream consultant (Deepali Sinha Khetriwal from SOFIES) in collaboration with the GIZ team.

3.3.2 Value Chain Based

Any new business idea that is dependent on changes in or re-arrangement of stakeholders in the current service or value chain for e-waste management and related added services would be grouped here. As such selected government departments that would form the basis for the establishment of a Green E-waste Channel (as a new service model for the safe collaboration of all service providers) would warrant such an alternative business model.

3.3.3 Activity Based

Any activity/educational change induced alternative income opportunities are discussed here. Training of scrap workers to become artisans through the proposed "Badge Qualification System" is an example of this cluster

3.3.4 Operations/Technology Change Based

Here is a grouping made of any alternative business models and ideas that are based on a technology change. One of the most evident examples for a required technology change would be the promotion of cable granulation instead of cable burning. Getting involved with running and supporting a Swop Shop as an alternative or at least additional income opportunity also counts as an example for a business model based on operational change

3.3.5 Alternative Material Stream Based

Finally, this cluster in the chosen methodology groups together any business models that promise the development of new products and markets based on materials streams that provide alternatives to metal. As such it focusses on material types such as plastics and glass but also paper and any other recyclables of both inorganic and organic nature. As mentioned above- this particular segment is not within the scope of this research and covered by consultants from another work stream.

3.4 External Factor Evaluation and Internal Human Skills Needs Profile:

The remaining chapter sections describes the framework that will be applied for the evaluation of all the "alternative income opportunity" ideas as discussed under Chapter 4. The framework comprises evaluation criteria and their respective ranking weights for both the external influences as well as for the required internal "human skills" that need to be in place to make any suggested alternative income opportunity idea a likely candidate for success. Both the external and internal evaluations are depicted in a comparable "at a glance format" on the respective "character briefs" for each business idea and in the shape of Excel based "spider diagrams".

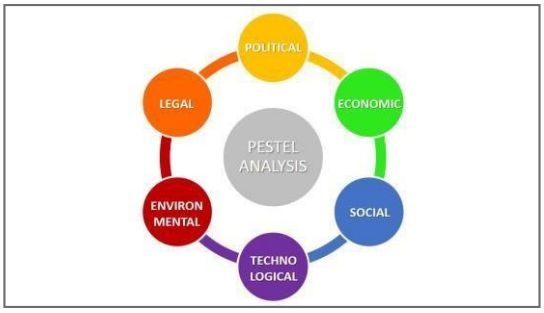
3.4.1 The Framework and Chosen Criteria to Assess and Rank the Weight of *External Impacts* based on a PESTEL Analysis

In order to both capture and assess the feasibility and viability linked to external influences in each of the three pillars of sustainability namely:

- Social
- Economic
- Environmental

a common business evaluation tool is applied known as a PESTEL Analysis. Essentially a PESTEL analysis is "a framework or tool used by marketers to analyse and monitor the macro-environmental (***external marketing environment***) factors that have an impact on an organisation" (or in this case rather on a business idea that promises the potential for alternative income). It is then used to further inform a more detailed SWOT Analysis. The aim is to systematically group chosen GIZ specific ranking criteria (as described in the chapter below) under these PESTEL Analysis headings.
PESTEL is an acronym and offers a macro-environmental evaluation for the following key areas

P- Political
E-Economic
S-Social
T-Technological
E-Environmental
L-Legal



Source: https://www.business-to-you.com/scanning-the-environment-pestel-analysis/

3.4.1.1 PESTEL Inspired GIZ Criteria (Used as Parameters for the Ranking Tool)

With the PESTEL headings in mind and as described in the chapter above the following differentiation and grouping of GIZ specific evaluation criteria plus their ranking weights is suggested and described in more detail further below as follows for each of the individual character briefs that describe a distinct business model idea in Chapter 4:

	POLITICAL	ECONOMIC	SOCIAL	TECHNOLOGICAL EASE	ENVIRON MENTAL	LEGAL
GIZ Criteria	Likelihood for Political Support	Potential for Job Creation: Direct Employment and/or Enterprise Development Opportunities	Assumed Social Effectiveness: Child Protection/Youth Involvement/ Gender Equity. Perceived Improvement of Social Standing	Viability and Appropriateness: Level of Technical Complexity, Specialist Technical Skills and Costs involved	Environmental Integrity and Compliance Assurance & Wider Community Acceptance and Support	Legislative/Policy Based Support
Ranking	0-5 value where 0 is lowest and 5 is highest	0-5 value where 0 is lowest and 5 is highest	0-5 value where 0 is lowest and 5 is highest	0-5 value where 0 is lowest and 5is highest	0-5 value where 0 is lowest and 5 is highest	0-5 value where 0 is lowest and 5 is highest

Figure 4: The GIZ Alternative Income Opportunity Criteria and their Ranking Options

3.4.1.1.1 Likelihood for Political Support

All discussed Alternative Income Opportunities will be evaluated according to the likelihood of political support they might receive. The latter would e.g. be based on existing (or for the future planned) political programmes and envisaged party manifesto outcomes. The closer an alternative income opportunity can be linked to a known political agenda the more favourable this is considered and therefore higher ranked in the respective character brief.

3.4.1.1.2 Potential for Job Creation: Direct Employment and/or Enterprise Development Opportunities

Job creation potential (as THE key economic indicator chosen) can be either assessed through the number of direct (and typically formal sector based) employment opportunities generated through the proposed intervention or how much self-employment options in form of enterprise development arise. Typically, in the upliftment and formalisation of the informal sector the latter is more relevant and feasible than succeeding with the classic idea of creating a "8-5 job" for these individuals.

3.4.1.2 Assumed Social Effectiveness: Child Protection/Youth Involvement/Gender Equity/Social Standing Improvement

This assesses the potential of both basic worker protection (to avoid child labour) as well as inclusivity of stakeholder groups that are often neglected and disadvantaged- namely the youth as well as females. It also ranks any improvement of the general social standing of a target group individual as a direct result of being involved in this alternative business model idea.

3.4.1.3 Viability and Appropriateness: Level of Technical Complexity, Specialist Technical Skills and Costs involved

The implementation of certain technologies might be required to realise a suggested alternative income opportunity idea and assess its business potential feasibility. In that case an evaluation is

required regarding the relative complexity of this technology, the level of skills that are directly required to apply the technology and the subsequent costs.

3.4.1.4 Environmental Integrity, Compliance Assurance and Wider Community Acceptance

This criterion establishes to what degree environmental integrity and compliance with the law can be guaranteed e.g. by applying good practices to replace any worst practice. It also assesses if there are any negative impacts affecting the surrounding community as a result of the suggested alternative income idea.

3.4.1.5 Legislative/Policy Based Support

The suggested alternative income opportunities need to be aligned as closely as possible with existing Ghana specific as well as relevant international legislation. A suggested alternative income opportunity under discussion must therefore not violate key strategic legislative tools such as the Technical Guideline document for the responsible handling of all e-waste in accordance to a defined Tier system (whereas the latter is based on a detailed permissions/prohibition focussed operational framework for all stakeholders in the e-waste value chain).

3.4.2 The Framework and Chosen Criteria to Assess and Rank *Internal Evaluation Factors* linked to Human Skill Needs Available vs. Required

The inspiration for the establishment of Internal Evaluation Factors is derived from the globally widely accepted "Sustainable Livelihood Framework"[41]. The British Department for International Development (DFID) Sustainable Livelihoods Framework was developed in order to organize and improve organizations' efforts to eliminate poverty. As part of this framework there are five assets in five categories outlined that are deemed necessary for the pursuit of positive livelihood outcomes namely:

- Human capital (i.e. the amount and quality of knowledge and labor available in a household)
- Natural capital (i.e. the quality and quantity of natural resources, ranging from fisheries to air quality)
- Financial capital (i.e. savings and regular inflows of money)
- Physical capital (i.e. the infrastructure, tools, and equipment used for increasing productivity)
- Social capital (i.e. social resources, including networks for cooperation, mutual trust, and support)

Under due consideration, but with the required adaptation of the DFID Sustainable Livelihood Framework, the following "Human Skills Availability vs Requirements" should be evaluated for each of the suggested alternative income opportunity ideas under further discussion (and according to the

[41] http://atha.se/content/sustainable-livelihoods-framework

intended target group of the type of scrap worker who is thought to benefit most from the business idea):

E-Educational
S-Social
F-Financial
P-Physical Strength

	EDUCATIONAL	SOCIAL	FINANCIAL	PHYSICAL
GIZ Criteria (Internal): Basic Human Skills/Abilities	Level of basic education available vs required	Collaboration and teamwork potential available vs. required	Level of business savviness and financial management skills in place vs required[42]	Fitness levels available/ required[43]
Ranking	1-5 as a comparison between availability and actual requirement	1-5 as a comparison between availability and actual requirement	1-5 as a comparison between availability and actual requirement	1-5 as a comparison between availability and actual requirement

Once more this internal evaluation part of the framework) will be shown in each of the "character briefs" described in the next chapter in form of a weight-ranked bar diagram on the first page.

[42] Evaluates the chance of the proposed alternative income opportunity to be a financial success
[43] Is the proposed alternative income opportunity demanding a minimum physique which would make the proposed activity unsuitable for a target group member?

4 Alternative Business Models Described

This chapter provides an overview of all the Alternative Business Models named and described in all the required details in form of full "Character Briefs" and as an Appendix to this report.

NAME OF THE CHARACTER BRIEF	SHORT DESCRIPTION	DISTINCT TYPE	BIGGEST POTENTIAL
Agbogbloshie Workers Protection Fund (AWPF)	Model to generate funds for the education and protection of informal sector operators	Organisational- Based	Designed to be robust. Built on contribution by multiple stakeholders
E-Waste Recycler Alliance Model	Collaboration of existing formal recyclers with each other and skills development of affiliated SMMEs	Organisational-Based	Support of informal sector with skills and finances
Integration of Trained Scrap Workers into Global Value Chains (Best of 2 Worlds)	Selective and therefore safe integration of educate informal sector members	Value Chain-Based	Collaboration with the Alliance under supervision of Government with fair market access
Government Supported "Green e-Waste Channels"	Safe removal of government based WEEE by informal type businesses supported through the formal Recycler Alliance	Value Chain-Based	Unlocking government stockpiles safely and gaining valuable data from participants
W2A and Upcycling based Waste Beneficiation	Collaborative model between Alliance and local artisans	Activity-Based	Strengthening of local product development and related local markets for functional components and value fractions
Pop-Up Store & Collection Hub	Using empty buildings for temporary collection and waste art selling events	Activity-Based	Proven strategy to fight urban decay and promote local arts while offering convenient WEEE bring-

			back facility to households
"Badge System" based alternative Advanced Education and Vocational Training System	Systematic modular training curriculum to uplift and retrain interested informal sector parties toward alternative income opportunities	Activity-Based	Alternative educational system to existing ones that are typically unattainable financially and logistically for Agbogbloshie scrap workers
Functional Component Harvesting	Utilising badge system based training to teach informal sector high value functional component harvesting over simple material recovery	Operations/Technology Change-Based	Exploitation of WEEE and other scrap metals with maximising financial returns
Mechanical Cable Stripping in a Piloting Payment System	Creating a range of incentives (including the enforcement of penalties) to utilise mechanical cable stripping over burning	Operations/Technology Change-Based	Immediate EH&S benefits to the worker and massive improvement to the operational environment
Swop Shops	A money-free reward system to collect all sorts of recyclables found at Agbogbloshie	Operations/Technology Change-Based	Great proven opportunity to integrate women as they are the natural target group to benefit

Figure 5: Summary Table of Alternative Income Opportunities described as "Character Briefs" in the Appendix

5 Conclusions and Further Recommendations

This reports provides a wide range of suggested Alternative Income Opportunities for the wider scrap metal work force (and any of their direct and indirect supporting services) operating in and around Agbogbloshie.

Each of the business models described as a generically designed, high-level strategy "Character Brief" has been deliberately developed in a stand-alone format so that themed workshops can be conducted as the next suggested step to unpack with the *intended beneficiaries* of the perceived business model and its perceived usefulness and viability.

While the proposed stakeholders in some of the Character Briefs are the same, the business models are designed to be able to function independently and are not financially dependent on each other to be possibly viable. An exception is the model described for the suggested Agbogbloshie Worker Protection Fund (AWPF) as this fund is crucial to carry sustainably the wider education and personal protection of vulnerable informal workers and is designed to be supported through many different channels.

With the chosen clustering of the presented business model it is possible and recommended to hold themed workshops that only focus on a particular distinct type under discussion- e.g. all business models grouped under "value-chain" based can then be directly scrutinized and compared for their likely success and general implementation potential e.g. in a pilot project format and for the defined target group.

The PESTEL based external evaluation chart as well as the internal capacity/capability ranking should be presented merely as a first impression and attempt for some weighting by the author of this report but most definitely be further discussed with the aim to gain much needed local insight from the parties for which these alternative business model ideas are intended and to adjust any of the first ranking for the perceived suitability accordingly.

In conclusion it needs to be noted that it is highly recommended that any these Alternative Income Opportunity models (developed for Ghana by a foreigner to Ghana) need to be LOCALLY evaluated scrutinized and then ranked by the people of Ghana (set to benefit from them) for their perceived implementation potential. This should ideally be done with the support of GIZ/KfW facilitated workshops that are designed to bring all the relevant people (including any of the required stakeholders to make the business model work) for a robust discussion around the same table.

6 References

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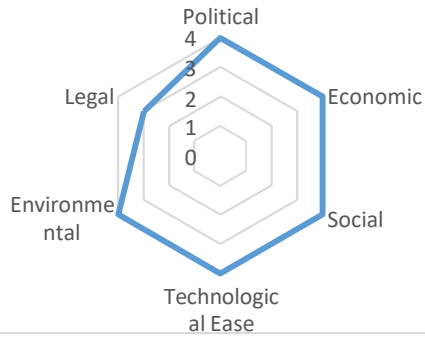
Appendix (List of Character Briefs)

AGBOGBLOSHIE WORKERS PROTECTION FUND (AWPF)

Background

The AWPF is the suggested funding mechanism for most of the business model subsequently described in other case studies. The idea for the Fund, the financial flows and the roles and responsibilities as suggested in the overview business model sketch was conceptualized first in the "Design Workshop Training" which took place in the first week of April 2019. It was designed in response to strong sentiments and concerns raised by senior GIZ staff that any alternative income opportunities suggested as part of the currently funded GIZ Ghana e-Waste project must ultimately become self-sufficient and as such fully economically viable. Trainees well acquainted with local stakeholder and business dynamic knowledge provided invaluable insights regarding the type of required third party support systems locally available to host as well as to audit the operational side of the proposed AWPF.



0=no; 5=high

AWPF

The objective of the suggested structure of the AWPF is to ensure a self-sufficient funding system that will provide the financial means in the long-term to systematically:

- *Financially carry and further develop the "Badge System" model (see relevant case study for details) as an alternative advanced adult education and vocational training system for the benefit of the informal sector of Agbogbloshie based scrap workers and their support systems.*
- *Financially assist GASDA to take on the role of managing the Badge System in all its aspects and to identify suitable candidates to enter training programmes in accordance to the envisaged basic and advanced modules that will make up the "Knowledge Tree" structure.*
- *Support the establishment and operation of swop shops as the latter by design (see also relevant case study) are meant to particularly benefit women and children.*
- *Finance PPE equipment that will be handed out to vulnerable informal sector workers at Agbogbloshie through GASDA*

0=no; 5=high

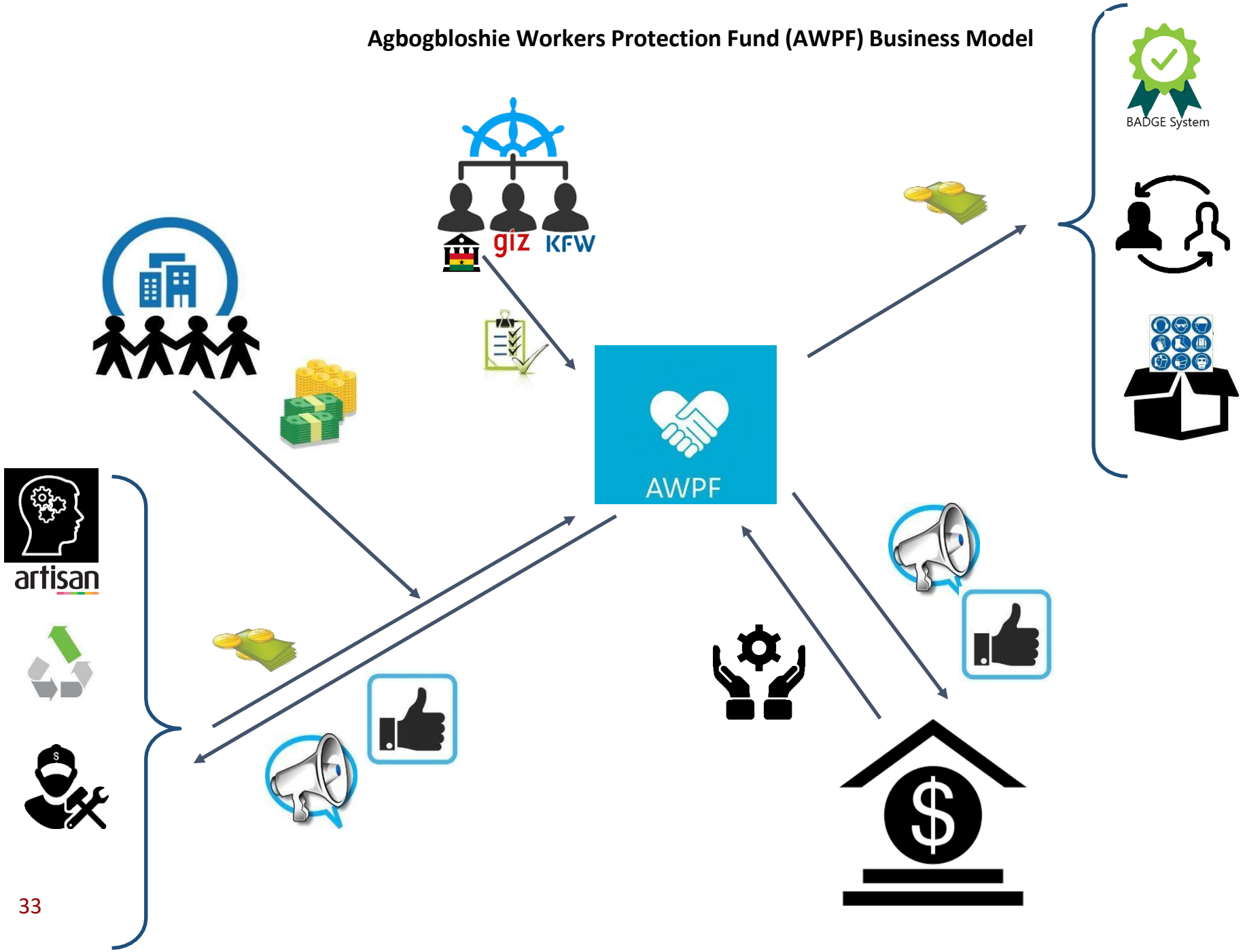
Key Target Group(s)

Alliance Recyclers and already formalized Badge System trained parties to provide funds to support trainees and issue PPE to the informal sector

SWOT Analysis

Strengths	• Peer to peer support system. Formal and trained industry members support the informal ones financially • Third party administration of funds raised for the AWPF e.g. as suggested by ECOBANK minimizes risk of maladministration and personal enrichment of individuals • Steering committee to oversee and audit the AWPF adds additional check and balances to the system. Ideally comprising of key system funders as well as representatives from Ghana Government • Multiple income sources for the AWPF not only from the Alliance but also Badge System developed and trained artisans, repairers, refurbishers and component harvesters • Multiple beneficiaries of the fund with GASDA to be able to access monies only after undergoing an third party audited application process for the release of funds linked to certain proposed activities.
Weaknesses	• Finding a third party that will host the AWPF (ideally considering this as an attractive social corporate initiative that will bode favorably with shareholders and in Annual Sustainability Reports) is crucial. • A dedicated steering committee is required that has no vested interest in any aspect of the proposed AWPF operations. • Extracting payment into the AWPF as envisaged through Alliance Members as well as Badge System developed individuals, businesses and enterprises might proof challenging and could be seen as a undesirable penalty that people will try to avoid by underreporting their own benefits and incomes (on which the contributions to the fund would be essentially based)
Opportunities	• If all elements and stakeholders required for a functional AWPF can be identified and engaged as envisaged the fund set up and operation including all financial flows should be sustainable and viable irrespective of any more additional funding available (e.g. via GIZ or KfW) in future.
Threats	• Lack of monitoring and evaluation leading to mismanagement of funds by GASDA and/or by any of the envisaged direct target group beneficiaries. • Lack of payment leading to depletion and breakdown of the AWPF

Agbogbloshie Workers Protection Fund (AWPF) Business Model



SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE ABOGBLOSHIE WORKERS PROTECTION FUND BUSINESS MODEL ICONS

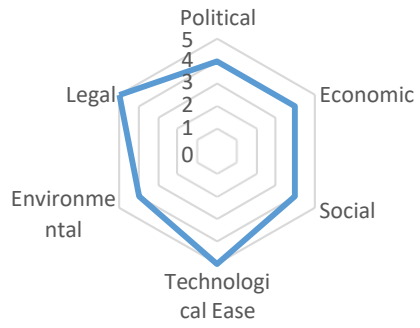
								
Ghana e-Waste Recycler Alliance	Reputation	Marketing and Exposure	Agbogbloshie Worker Protection Fund	Steering Committee: including GIZ, KfW, Governmen t reps	Compliance reporting: Monitoring & Evaluation	Badge System (see separate Business Model)	Swop Shop (see separate Business Model)	PPE products (handed out by GASDA to informal workers
								
Financial Institute (possibly ECOBANK)	Money (more)	Money (less)	Support: Third Party Fund Hosting Services	Badge system trained artisans	Badge System developed Upcyclers and product manufacturer s	Badge System trained RepairersRef urbishers Component Harvesters		

E-WASTE RECYCLER ALLIANCE MODEL

Background

The GIZ has been actively supporting the development of a Ghana e-Waste Recycler Alliance with a fairly similar operational set-up and organisational structure as the SAEWA. During the last visit of the SAEWA Chair an informal meeting took place (facilitated by the GIZ) between the SAEWA Chair and most representatives of formal e-waste recycling facilities in Ghana including but not limited to the companies: City Waste, Blancomet, Atlantis Recycling and Presank.

From first discussions and exchanges of experiences it became evident that these Ghana recyclers see a strong necessity for the formation of an "Alliance" e.g. to become a coordinated voice of the industry to engage with Government and motivate for the release of EPR funds. In addition, the recyclers who are keen to start an Alliance need to build on and protect their current recycling investments while staying competitively priced to dissuade alternatives of dangerous informal practices. As such their interests need to be protected to be able to optimally contribute with their services to the entire Ghana e-waste value chain.



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Description of the e-Waste Recycler Alliance for Ghana

Targeted are formal recyclers of any type of e-waste who are committed to collaborate and add value to each other's operations while raising the national standard for acceptable treatment practices and through voluntarily complying with the Ghana e-Waste Management Technical guidelines

- *A "Member" of the Alliance needs to be fully legally compliant*
- *An "Affiliate" of the Alliance can be any informal e-waste management "economic operator" (SA or UBA type) who is willing to commit to a structured business development and compliance building "incubation" programme over a set period of time as suggested by the SAEWA model in conjunction with recommendations given through the SRI Guidance Principles[44]*
- *Both Members and Affiliates pay a contribution towards the operation of the Alliance dependent on size and structure of the business*
- *The Alliance (as a self-regulatory voluntary industrial organisation) is jointly marketing, raising awareness and providing recognition as well as education and awareness to the public and private sector*
- *The Alliance will form Ghana's official voice for the entire e-waste management industry e.g. to engage with MESTI/EPA*

0=no; 5=high

Key Target Group(s)

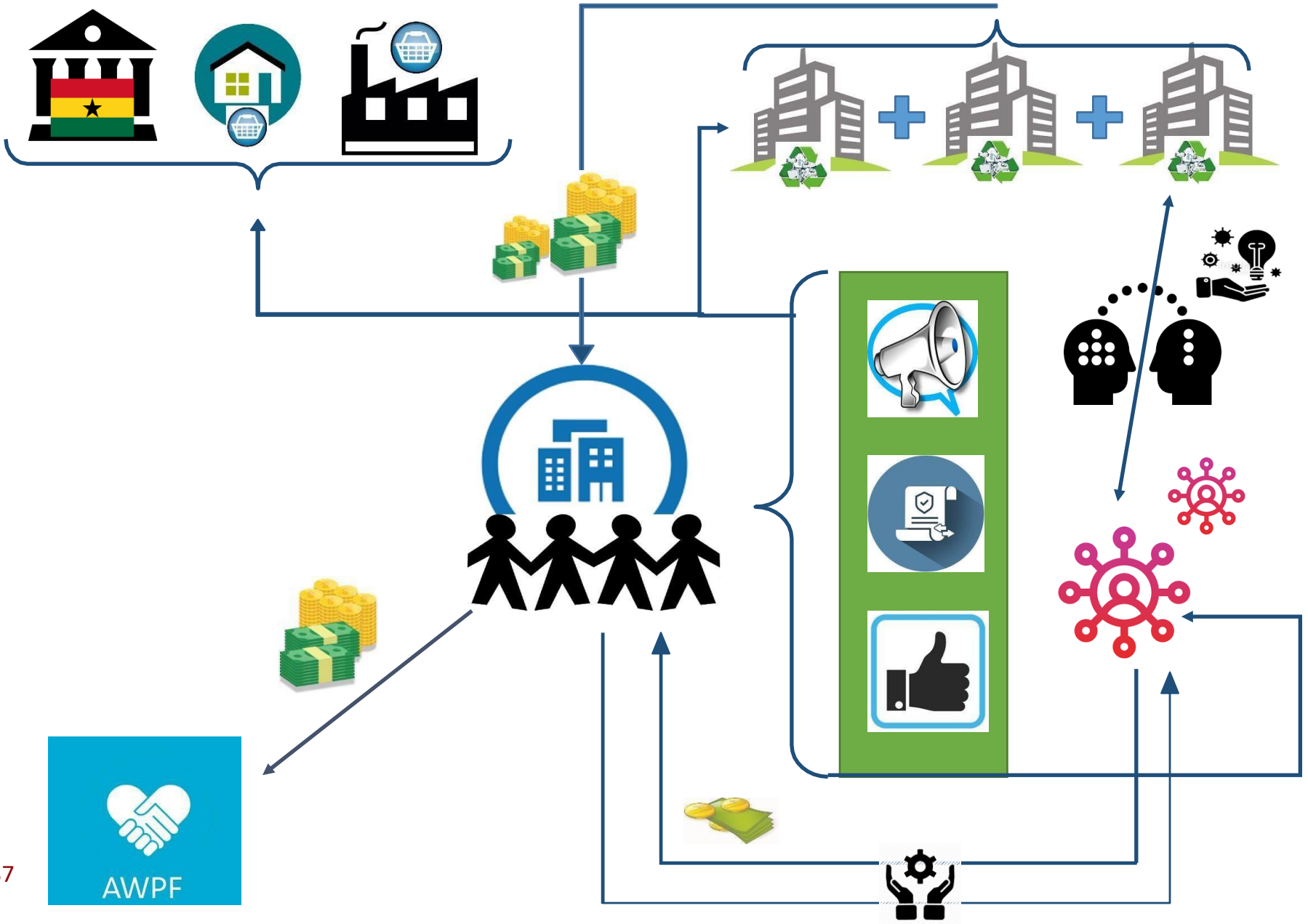
Formal recyclers who are organised as Members in an "Alliance" (as a first step)

[44] (ISO: IWA 19:2017, 2017)

SWOT Analysis

Strengths	• The Alliance collaborative model dovetails with the envisaged "Optimum Recycling Value Chain" for Ghana. • The Alliance actively promotes partnerships between key stakeholders in the value chain including: authorities, formal recyclers as well as representatives of the informal sector willing to join as Affiliates • The Alliance is set to provide a key source of regular financial contributions to the envisaged future "Agbogbloshie Worker Protection Fund". • Environmental benefits can be reaped by supervising and controlling the permitted activities conducted by Alliance affiliated recyclers. • The Alliance offers a structured approach to the development and improvement towards ultimately full formalization of currently informal sector operators. • The SAEWA is able and willing to share all lessons learnt, documents developed hence the Ghana Alliance can somewhat leapfrog and benefit from a much accelerated learning curve.
Weaknesses	• The project has a narrow scope of potential beneficiaries. It also does not promote gender equity in particular • A dedicated chairperson is required that has no vested interest in any aspect of e-waste management and is prepared to work for (if following the SAEWA model) a fairly limited amount of income derived as percentage of the monthly fees raised for Members and Affiliates. With money flowing into the AWPF this is likely to be even less.
Opportunities	• The Alliance to become a self-regulatory voluntary industrial organisation that will be able to form the official voice of the entire industry. • Members of the Alliance to be in a very strong position to negotiate and motivate action e.g. towards the recovery of cost from the Government managed EPR fund.
Threats	• Lack of enough Member/Affiliate fees to properly fund the Alliance and its Chair might well translate into a poor performance unless (at least initially co-funded to establish key set-up structures and enable any required marketing. • Uncontrolled takeover of non-critical activities and functions through the planned e-waste recycling facility violating its core purpose of only being part of the solution without competing directly against existing (Alliance organised recyclers and/or displacing the informal sector and unfairly competing against existing formal recyclers

e-Waste Recycler Alliance Business Model



SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF RECYCLER ALLIANCE BUSINESS MODEL ICONS

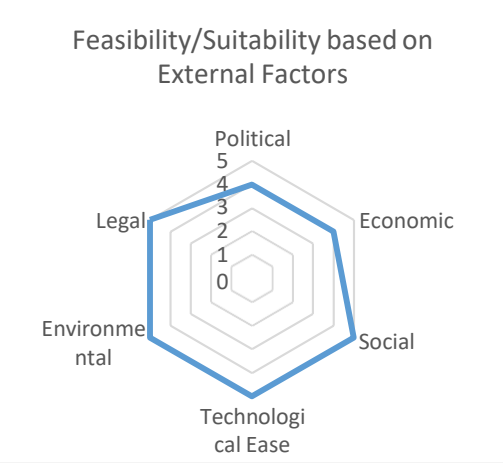
								
Ghana e-Waste Recycler Alliance	Reputation	Qualification/ Right of Operation	Marketing and Exposure	Ghana Government and major users of EEE	Household sector customer and user of EEE	Business customer and user of EEE	Knowledge Transfer and Exchange of Professional Experiences	Formal Recycler and Alliance MEMBER
								
Agbogbloshie Worker Protection Fund	Money (more)	Money (less)	Business Development Support	Alliance AFFILIATE				

INTEGRATION OF TRAINED SCRAP WORKERS IN GLOBAL VALUE CHAINS (BEST OF 2 WORLDS)

Background

The Oekoinstitute's "Best of 2 Worlds" 2012-2015 project research key strategic approach was based on the understanding that the best overall recovery and treatment efficiencies in the Global WEEE value chain can be derived by optimally combining (typically) informal and formal WEEE management activities in a structured and sequential manner.

Basically all research done in Africa conclude that both the collection efficiencies of informal collectors and the quality and optimal functional/material recovery of manual dismantling (opposed to mechanical shredding) is very good. However any end-use processing to recover a maximum amount of materials (e.g different types of metals) at their highest rate and best quality is clearly linked to the availability of sophisticated downstream metallurgical treatment technologies as currently only available through a handful of "state of the art" treatment and recovery facilities e.g. in the form or smelters or hydrometallurgical processing units.



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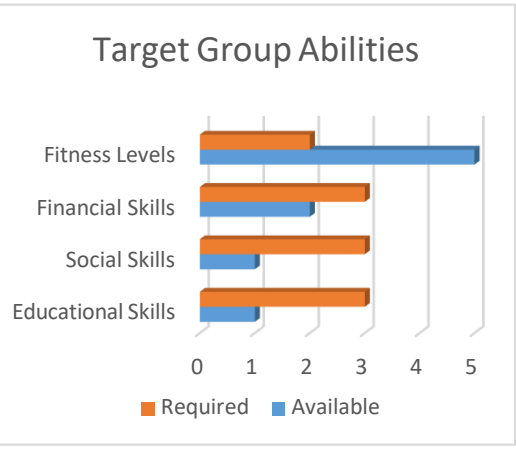
Description of the Scrap Worker Integration Model

The suggested integration of informal scrap workers (after being educated and trained through the GIZ Basic and Advanced Knowledge Tree Badge qualification system) needs to be designed as a vital part of the available combined work force (and in conjunction with the envisaged "Alliance affiliated collector scheme" and as discussed in a separate character brief). These workers could then add significant value to the global WEEE dismantling part of the value chain (by retaining whole functional and/or high value fractions through applying labour-intense and exclusively manual (opposed to mechanical) dismantling practices). They will be able to conduct any required CONTROLLED depollution steps whilst NOT being exposed to any "special treatment" of "selective fractions" that are problematic with regards to their EH&S impact. Therefore, they will be protected from the potential harm of engaging in uncontrolled worst practices such as smashing or burning.

Previously informal scrap workers would thereby form part of a Government supported and monitored dismantling service team and would benefit from both receiving regular volumes and suitable WEEE dismantling types from the Alliance affiliated collection scheme as well as secured and preferential (e.g. pre-approved) payment from the downstream final end-use processors and as part of a dismantling service team. The latter would comprise of the trained scrap workers, recycling firms that are licenced for Tier 4 type treatment and recycling as well as the planned Government EPR fee funded e-Waste plant to facilitate in addition any selective treatment required. Therefore, by collaborating with formal recyclers and the plant a sensible division of work (and related roles and responsibilities) can be achieved while scrap workers can benefit from better trade deals with overseas processors based on the ability to create the required economies of scales needed..



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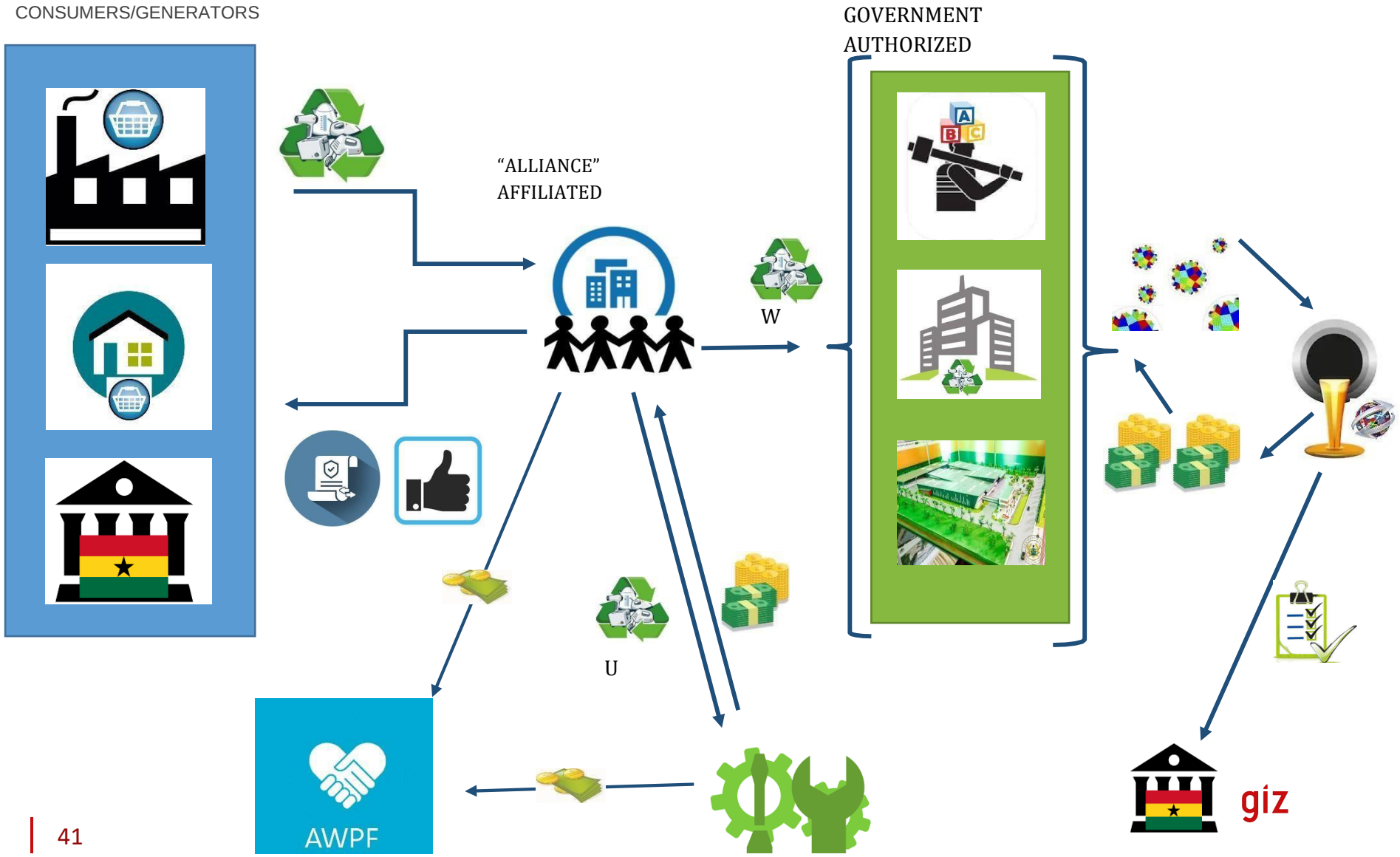
Key Target Group(s)

Former informal scrap workers who were trained via the GIZ Basic AND Advanced Knowledge Tree Badge System in all "Dismantling" related learner curriculum areas

SWOT Analysis

Strengths	• Dovetails and test all aspects related to “dismantling” of the envisaged “Optimum Recycling Value Chain” for Ghana • Actively promotes partnerships between key stakeholders in the value chain including: authorities, formal recyclers (organised in an Alliance) as well as specialised treatment facilities and end use processors • Practically applies and manages the separation of duties and responsibilities (as well as the associated EHS risks) as envisaged and described in the Ghana Technical Guidelines for the management of e-waste • Environmental benefits by supervising and controlling the permitted activities conducted by the formerly “informal scrap workers” • The project as a great social benefit scope since gender equity can be promoted by selecting the candidates for the required Knowledge Tree based badge system training • From a technical perspective this is not requiring any large investment supports as the activities will be limited to basic manual dismantling practices (typically facilitated through basic tools such as magnetic screw drivers etc.)
Weaknesses	• It is likely to be hard to clearly enforce and monitor the restricted assigned roles and responsibilities of the combined dismantling force and the three distinct stakeholders it comprises of.
Opportunities	• Strengthen the Blue Print Best of 2 Words approach in a pilot project format that can be relatively easy controlled, provides multiple stakeholder input which mimics the macroscopic environment and enables evaluation and monitoring for the Government and the GIZ. • Involves government both as a supplier of WEEE and as a monitoring and evaluation body (in partnership with the GIZ). This means it is easier to create a level playing field amongst the three different levels of service providers (SA, UBA, OBA) • Will provide a regular source of feeding the future Agbogbloshie Worker Protection Fund through contributions that will be raised on two different levels (the Alliance affiliated collection scheme as well as Repair/Refurbishment operators receiving any WEEE where functional components can be recovered/reassembled rather than materials be dismantled.
Threats	• Lack of supervision and required minimum control on the side of Government possibly leading to underfunding of the Agbogbloshie Worker Protection Fund. • Uncontrolled takeover of non-critical activities and functions through the planned e-waste recycling facility violating its core purpose of only being part of the solution without competing directly against existing (Alliance organised recyclers and/or displacing the informal sector and unfairly competing against existing formal recyclers)

Integration of Trained Scrap Workers into Dismantling Based Global Value Chain (Best of 2 Worlds)

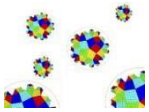


SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE BUSINESS MODEL ICONS

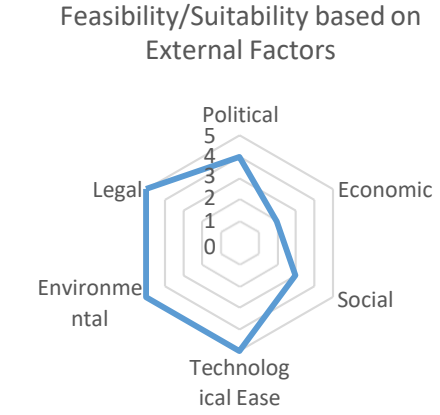
								
Reputation	Qualification/ Right of Operation	Ghana Government and major users of EEE	Household sector customer and user of EEE	Business customer and user of EEE	Agbogbloshie Worker Protection Fund	e-Waste	Ghana Alliance Affiliated e-Waste Collection Scheme	GIZ trained formerly informal scrap yard worker
								
Formal recycler	Government funded e-waste recycling facility	Material fractions of value	Money (more)	Money (less)	End processor of value fraction	Reporting of volumes and supply sources		

GOVERNMENT SUPPORTED “GREEN E-WASTE CHANNELS”

Background

Ghanaian government departments and offices are bulk e-waste generators. This includes also obsolete EEE (which however still carries considerable refurbishment potential) next to the actual e-waste. Traditionally, governments write off their previous assets by entering largely uncontrolled auctioning procedures and involuntarily contribute to the problem of uncontrolled e-waste flows entering the informal sector.

Few collaborations exist between formal WEEE recyclers and government departments to avoid such a scenario. Therefore, furthering partnerships between formal elements operating in Agbogbloshie through developing GREEN E-WASTE COLLECTION & PROCESSING CHANNELS is advisable to ensure that e-waste from government sources is treated responsibly and in a fully legally compliant manner at all times. For this the suggested public private partnership between government and formal (an “Alliance” forming) e-waste recycling companies should be designed.in a way that will also benefit the informal e-waste recycling economy by feeding into the future “Agbogbloshie Worker Protection Fund”.



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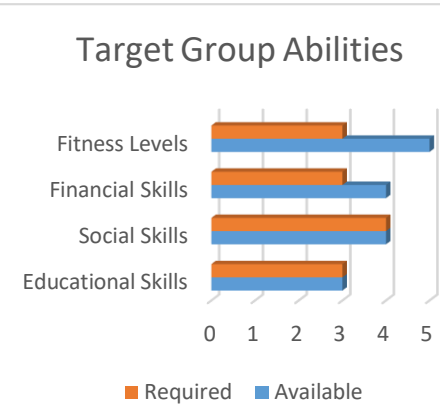
Green E-Waste Channel Description

Targeted are selected MESTI and EPA departments in a pilot project set-up. Government Participants will sign a SLA with the “Alliance” of formal recyclers committed to collaborate and add value to each other’s operations.

- *Free provision of any e-waste to participating Alliance forming recyclers (no need to buy in e-waste through auctioning) to be collected by Alliance affiliated informal collectors*
- *Number will be limited in pilot phase to Alliance recyclers only.*
- *Each of the recyclers to source 10 informal workers in Agbogbloshie to facilitate collection sorting and safe pre-treatment (e.g. focused manual dismantling) etc.*
- *Underwriting that e-waste is treated according to the integrated waste management hierarchy prioritizing recovery of “function”- e.g. through component harvesting over fraction or material recovery for recycling.*
- *Recyclers will only engage in activities as specified and authorised through the Technical Guidelines Tier system and according to their existing operational and technical capacities and capabilities.*
- *Recyclers will keep track, monitor and report back to GIZ and the Government on the types and volumes of Government e-waste that was reduced, repaired, reused and recycled.*
- *Small percentage of Green Channel profits made (after paying workers fairly) are going to the “Agbogbloshie Worker Protection Fund (AWPF).*
- *Any EPR funds additionally available to Alliance Member will be used to finance “special treatment” requirements e.g. in the new Ghana State Recycling Facility (GSRF) and/or safe disposal of hazardous fractions.*



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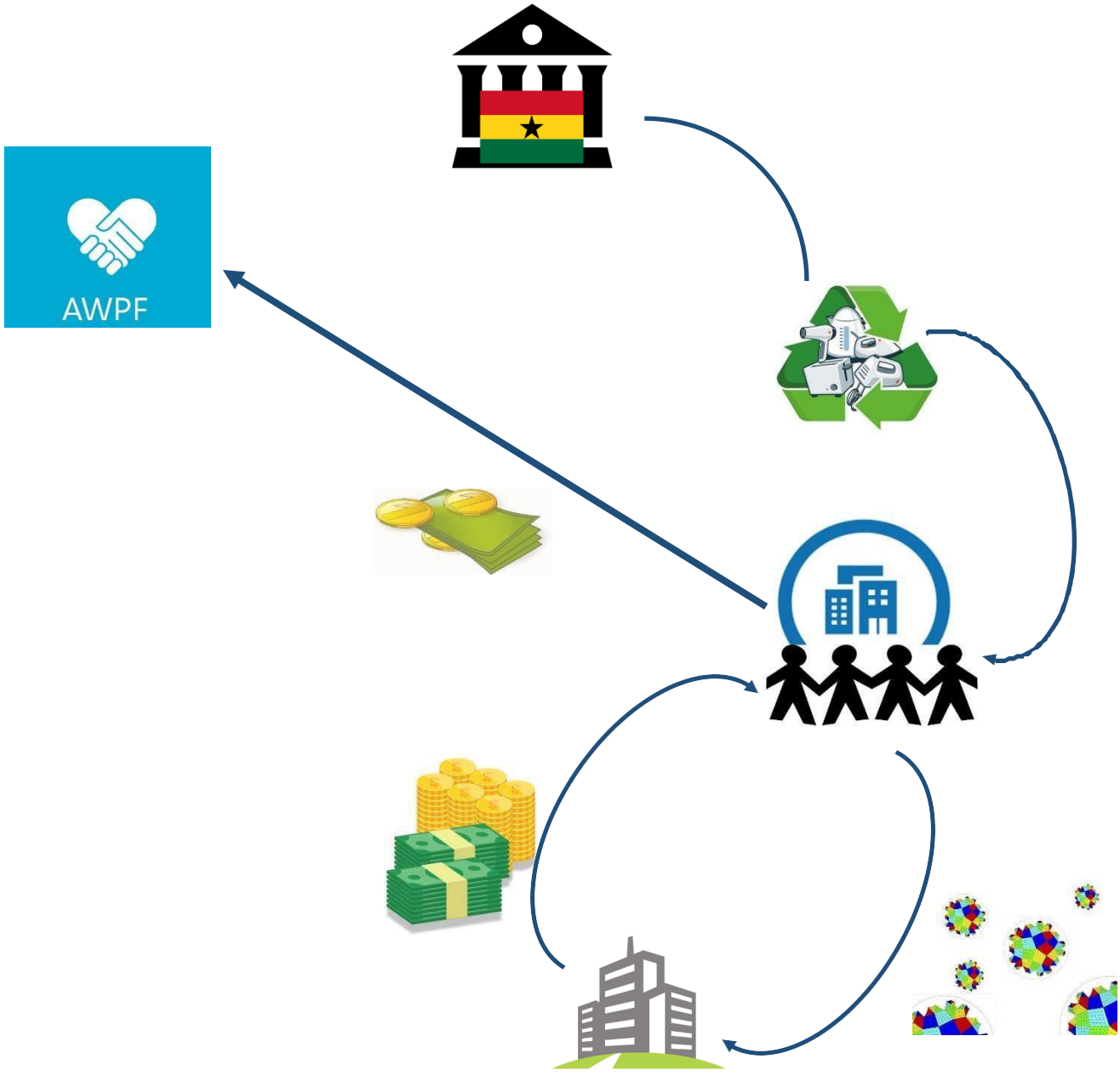
Key Target Group(s)

Alliance Service Providers (Formal recyclers working with informal collectors)

SWOT Analysis

Strengths	• Dovetails and test all aspects of the envisaged "Optimum Recycling Value Chain" for Ghana • Actively promotes partnerships between key stakeholders in the value chain including: Authorities, formal recyclers (organised in an Alliance) as well as GASDA as a third party voice and interest group of the local operators at large. • Practically applies and manages the separation of duties and responsibilities (as well as the associated EHS risks) as envisaged and described in the Ghana Technical Guidelines for the management of e-waste • Environmental benefits by supervising and controlling the permitted activities conducted by Alliance affiliated recyclers • Technologically not requiring any additional investments as any additional treatment steps required will be directed to specialist service providers including the new e-waste treatment facility
Weaknesses	• The Green e-Waste channel only directly benefits a maximum of 10 informal operators per Alliance affiliated formal recycler • The project has limited social benefits regarding a narrow scope of potential beneficiaries. It does not promote gender equity in particular • While built on collaboration, the proposed Green e-Waste Channel activities provide no opportunity for advancement of informal sector based individuals (e.g. through acquiring new skills or by furthering their education).
Opportunities	• Development of a Blue Print model in a pilot project format that can be relatively easy controlled, provides multiple stakeholder input which mimics the macroscopic environment and enables evaluation and monitoring for the Government and the GIZ as well as GASDA • Involves government as part of the set-up and will assist officials to gain deep insights into the practical challenges of responsible e-waste recycling which can then be used in firming up on legislation that will be feasible to follow and inclusive for all stakeholders in the value chain • Will provide a regular source of feeding the future Agbogbloshie Worker Protection Fund so that GASDA as the official "voice of the informal scrap sector" can utilise financial contributions from the Alliance to finance future (re-)training and upliftment programs and provide PPE to informal sector representatives who are operating at the Agbogbloshie scrapyard under dangerous and harmful conditions.
Threats	• Lack of supervision and required minimum control of the Green E-waste Channel system leading to mismanagement of the Agbogbloshie Worker Protection Fund. The latter might be due to either lack of payment of Alliance contributions as required or unauthorized, fraudulent expenditures on the side of GASDA • Uncontrolled takeover of non-critical activities and functions through the planned e-waste recycling facility violating its core purpose of only being part of the solution without competing directly against existing (Alliance organised recyclers and/or displacing the informal sector and unfairly competing against existing formal recyclers

Green e-Waste Channel Business Model

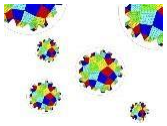


SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE BUSINESS MODEL ICONS

							
Ghana Government	**Alliance of Green e-Waste Channel Service Providers (Formal recyclers affiliated with informal collectors**	**e-Waste**	**e-Waste fractions**	**Money**	**Little Money**	**Buyer of components, fractions & materials**	**Agbogbloshie Worker Protection Fund (NPO)**

W2A AND UPCYCLING BASED WASTE BENEFICIATION

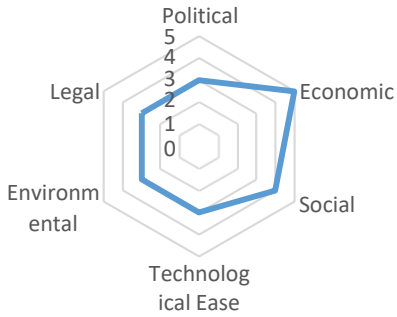
Background

The inspiration for this model is to find collaborative agreements between various stakeholders that can yield both a fund contribution to the AWPF (see separate case study) as well as promote and reward the work efforts of both enablers and beneficiaries of the future Badge System training model (see separate case study). Ghana has a mature art scene and the intention will be to build on the existing network and rope suitable artists into the Badge System to take in apprentices as an artisanal instructor.

Description of the Waste Beneficiation Model

The key objective of this business model is that Waste2Art and any other form of Upcycling (leading to value added products from value fractions found in WEEE) gets promoted and supported. Marketing efforts of products could and should be additionally supported by relevant economic development and funding organisations such the GIZ and KfW and there should also be a linkage to the suggested Pop-Up store business model (see separate case study).

Ghana Recycling Alliance Members would provide the source where Artists/Upcyclers/System Badge trained new artisans can find their materials and they would have access to them at a fair and possibly preferential market price. With the proposed business model creating steady demand of value fractions for the Alliance affiliated recyclers, the latter must contribute a percentage of the value fraction sales to the AWPF. Consumers of such products would ideally be businesses who would then buy suitable W2A/other product items in bulk as corporate gifts. Once more the GIZ/KfW in conjunction with RE:Publica and the planned Pop-Up stores could provide a vital marketing and general support function to all stakeholders that are part of the waste beneficiation initiative but first and foremost to aid the art/product manufacturing and trading entrepreneurs.



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Key Target Group(s)

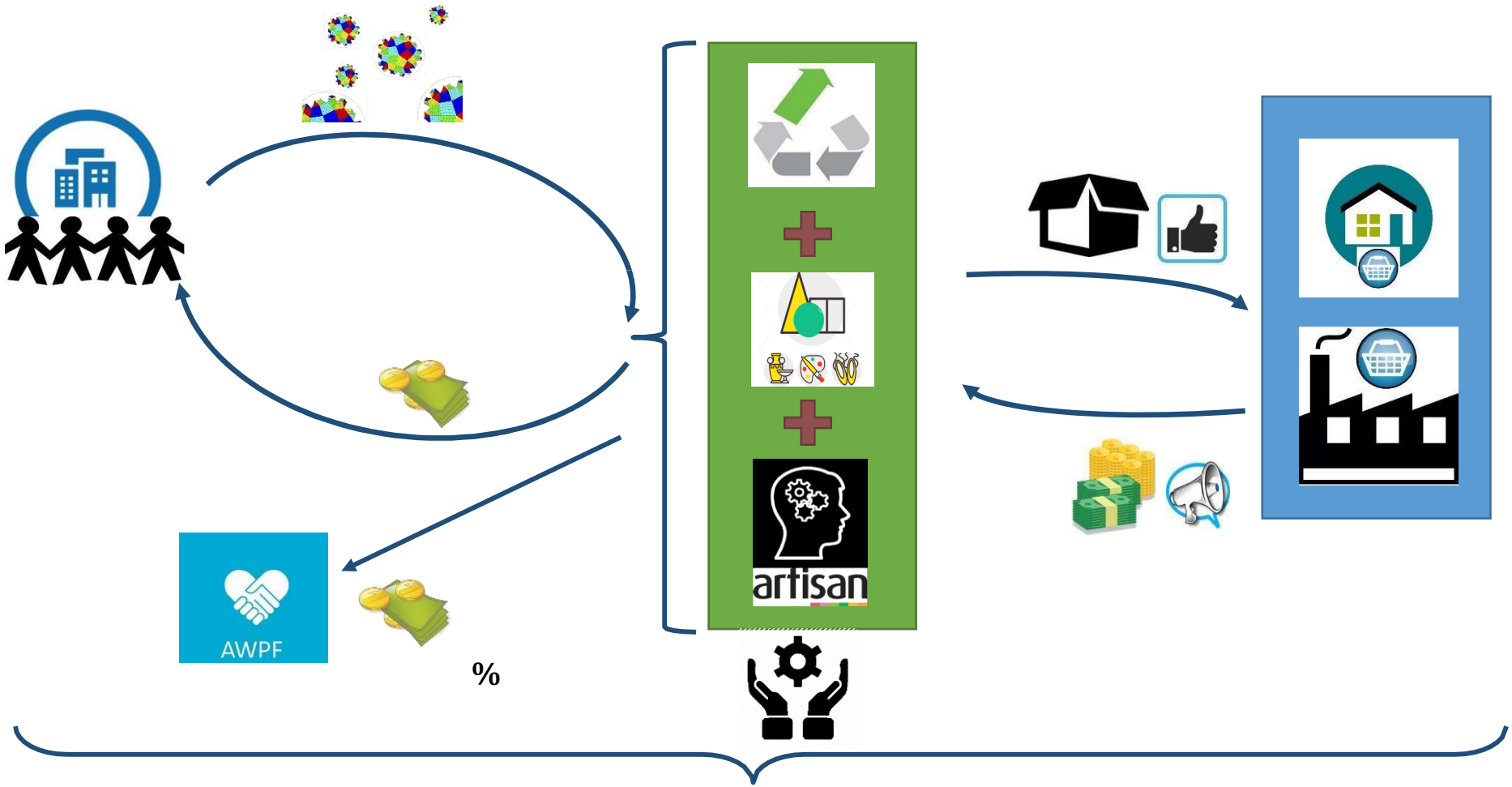
Targeted as the main beneficiaries of the suggested business model would be any representative from the pool of existing and future (Badge System trained/educated) Ghana Artists and local Product Manufacturers (Upcyclers) who is utilizing any form of WEEE derived value fraction as a vital input material of his/her art/product designs.

0=no; 5=high

SWOT Analysis

Strengths	• Unique local products through e-waste beneficiation • Stable demand for local e-waste components useful in product and art designs • Supports culture of Ghana as a country of high artistic and sophisticated African manufacturing hub • Corporates and households can conveniently support the artists and informal sector upliftment in Ghana by procuring (corporate) gifts • Great exposure and marketing vehicle for existing and new artists and artisans located in and around Accra both of formal and informal nature • Funding mechanism for the AWPF • Supports the clever use of alternative materials from e-waste (that might otherwise end up as waste) for art and product design
Weaknesses	• Depends on a local and ideally internationally demand for the art pieces and other manufactured products • Needs a reliable and supportive project champion and patron either as suggested via GIZ/KfW project incorporation or through the Cultural Ministry of Ghana etc. • Ghana residents (opposed to corporates) are typically limited in their disposable incomes and what they would be willing to pay for local art • No selling guarantees can be given or jobs are created from the outset- artists would have to collaborate as entrepreneurs with all risks involved • Alliance member might limit what they give to local artists if they get higher prices for simply selling value fraction in the normal local and international market places
Opportunities	• The Alliance Members can directly collaborate and support the local art scene plus indirectly they contribute to the AWPF • Assumed there is the demand for locally manufactured products and arts the Alliance members will benefit from strong local buying interest which might reduce the need to find overseas markets for certain fractions and even reduce/prevent their future landfill costs
Threats	• No local demand for art • No interest of Ghana corporate, formal business to contribute to the upliftment any informally operating work force as this would be seen as strengthening the “competition”

The Waste Beneficiation Business Model for Badge System Affiliated Upcyclers, Artists and Trained Artisans



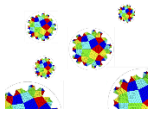
giz KFW

SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

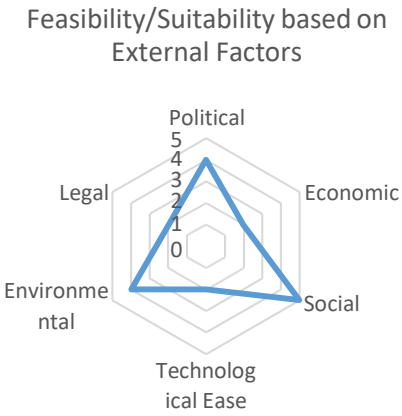
MEANING OF THE BUSINESS MODEL ICONS

								
Ghana e-Waste Recycler Alliance	Reputation	Marketing and Exposure	Badge System supporting (instructing) Upcyclers	Badge System supporting (instructing) local artists	Badge System developed and trained artisans	Household sector consumers	Business customer	Value fractions: components and materials
								
Agbogbloshie Workers Protection Fund	Money (more)	Money (less)	Product sales commission payable to AWPF					

POP-UP STORE & COLLECTION HUB

Background

The inspiration for the Ghana Pop-Up Store & Collection Hub model has been the UK based Brighton and Hove "Tech-takeback" initiative (http://www.techtakeback.com/ combined with various successful global attempts to temporarily revive and inject new purpose into otherwise empty buildings in abandoned or neglected parts of metropoles. As shown in the attached business model sketch the general idea is to combine an (e-) waste art exhibition event with a dedicated e-waste take-back and safe collection event. It is suggested to follow the set-up and collaborate with organizers of the recently held RE:PUBLICA innovation demonstration event and further work with the Ghana Government (Accra Municipality) to identify suitable building objects to be utilised for the suggested temporary combined pop-up store and e-waste collection events.



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Description of the Pop-Up Store/Collection Hub Set-Up

Identification and preparation of potential store/collection locations should be done in a work group that is led by the GIZ and contains stakeholders of all the target groups. Funding would be likely a combination of international sources (GIZ/KfW) and the Ghana Government.

- The Public at large- (private households and businesses) can enjoy a new and exciting exhibition & shopping experience while being offered a unique safe take-back and recycling service at the same time and the same location.
- The Accra Local Municipality has an inexpensive and unique way to counter any signs of urban decay by rejuvenating entire areas after empty buildings are identified and mapped as pop-up store/ collection and/or exhibition hubs.
- The e-Waste Recycler Alliance Members and wider system of affiliated service providers will be able to temporarily use the selected buildings to retrieve e-waste from the public.
- The Agbogbloshie informal work force benefits since a percentage of the sales/recycling proceeds from this events are earmarked to flow into the Agbogbloshie Worker Protection Fund.

0=no; 5=high

Key Target Group(s)

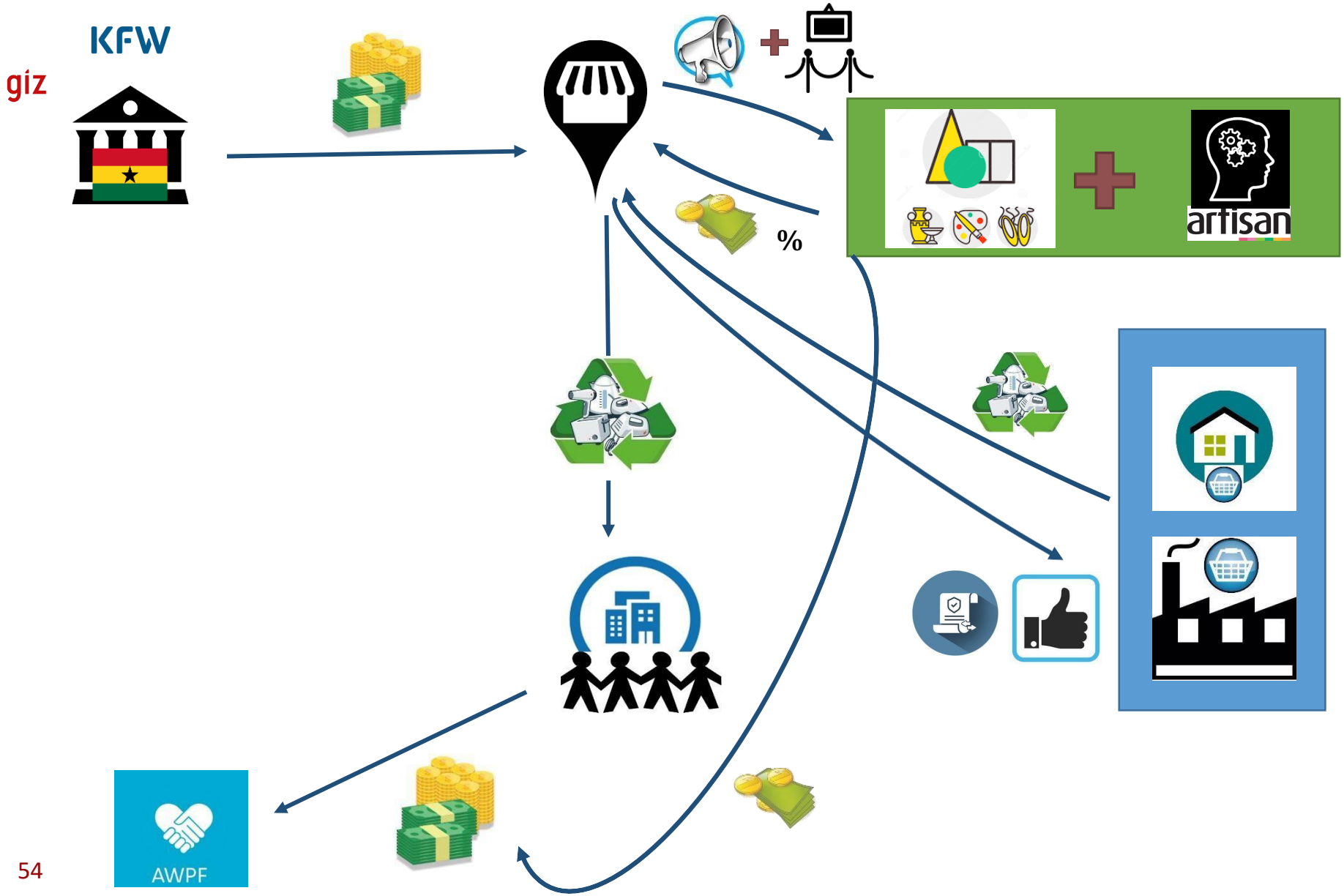
Targeted as the main beneficiaries of the suggested concept would be:

- Ghanaian Artists (including scrapyard based product manufacturers and any new and emerging artisans

SWOT Analysis

Strengths	• One-stop shop exhibition, shopping and take-back experience for the public • Safe space for take back for all types of e-waste but in particular any consumer electronics • Rejuvenation of neglected buildings by temporarily assigning a different purpose to them • No issues with legally imposed temporary storage volume limits for e-waste recyclers since the pop-up events are not held long enough to violate storage minimum requirements • Great exposure and marketing vehicle for existing and new artists and artisans located in and around Accra both of formal and informal nature • Funding mechanism for the AWPF with two sources contributing to the latter (percentage of art sales and from recycling proceeds) • Build on the proven UK success model and piggy-back on RE:Publica
Weaknesses	• Requires willingness of various parties and departments within the Municipality to collaborate • Based on the assumption that dedicated external funding is made available for the establishment of the pop-up stores –either via the Ghana Government or external international funding sources (GIZ/KfW) or any combination thereof. • Heavy reliance on obtaining information from Accra Municipality regarding state and location of buildings potentially suitable • Dedicated staff is required to plan, organise and facilitated the envisaged events.
Opportunities	• The Alliance Members and Affiliates can benefit from having access to add-on collection locations for e-waste • Basic public environmental education can take place on the back of such events
Threats	• Lack to establish a sustainable funding model solution for the combined pop-up art expo, store and take back events. • Unwillingness to honestly disclose sales and recycling profits made through the events leading to underfunding the AWPF

The “Pop-Up Store & Collection Hub” Business Model



SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE BUSINESS MODEL ICONS

								
Pop-Up Store and Collection Hub	Reputation	Qualification/Right of Operation	Marketing and Exposure	Ghana Government and major users of EEE	Household sector customer and user of EEE	Business customer and user of EEE	e-Waste	Ghana e-Waste Recycler Alliance Service providers
								
Agbogbloshie Worker Protection Fund	Money (more)	Money (less)	Sponsored exhibition and sales space	Sales Commission payable from artists	Established Ghanaian artists	Newly developed and trained artisans		

"BADGE SYSTEM" BASED ALTERNATIVE ADVANCED EDUCATION AND VOCATIONAL TRAINING SYSTEM

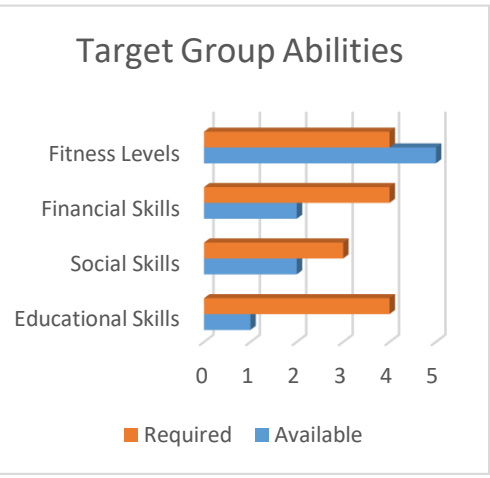
Background

Agbogbloshie is a place where many artisans are located. It can be considered to be like a giant "Makerstation" or "Innovation Hub" with many specialist skills on offer. Most of the people operating in the wider Agbogbloshie informal scrap yard operating sector (many of whom are involved in potentially dangerous and harmful recycling practices) are poorly educated. Such individuals typically do not have easily access (due to financial constraints and mobility restrictions) to Ghana's educational facilities suitable and available for adult learning opportunities. Dangerous and harmful practices such as the burning of cables (but also handling any other problematic fractions as defined in the Ghana Technical Guidelines for the Responsible Treatment of e-Waste) have now been made officially illegal for these informal sector representatives. It is proposed that the GIZ designs and funds an alternative "badge system" based education and vocational training system in partnership with Agbogbloshie located artisans, artisan schools and maker stations as further described below.

0=no; 5=high

Badge System Pilot Project Description

- *Targeted and eligible are up to 25 individuals (jointly identified and nominated by GASDA and GIZ) who have attended all five future "Knowledge Tree Programme[45]" based basic training modules.*
- *Such individuals must be ideally engaged in dangerous and unsafe activities typical for the key target group members described below with a desire to upskill themselves towards alternative income opportunities.*
- *GIZ /GASDA mapped artisans in and around Agbogbloshie will be incentivized to take in trainees/apprentices by providing them with business marketing exposure and general public recognition.*
- *Apprentices will be supported through the "Agbogbloshie Worker Protection Fund" to compensate for any loss of income incurred as a result of giving up previous illegal, dangerous work activities.*
- *Apprentices to choose a FIRST future skill ONLY that will be co-funded.*
- *Apprenticeship is a minimum of 3 months at master site and includes the attendance of Knowledge Tree Programme based "Advanced Training Modules".*
- *Badge System to track artisanal and learning achievements that can then be achieved and "evidence based" captured and tracked–e.g. by embedding a video clip showing that skill executed.*
- *Learners will be linked up /gain free access to any the Hive or any other maker station to have access to further tools and skills etc.*
- *Envisaged upskill programme must be designed that it provides an accepted format and can be endorsed by other (adult learning) parties and programmes..*



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Key Target Group(s)

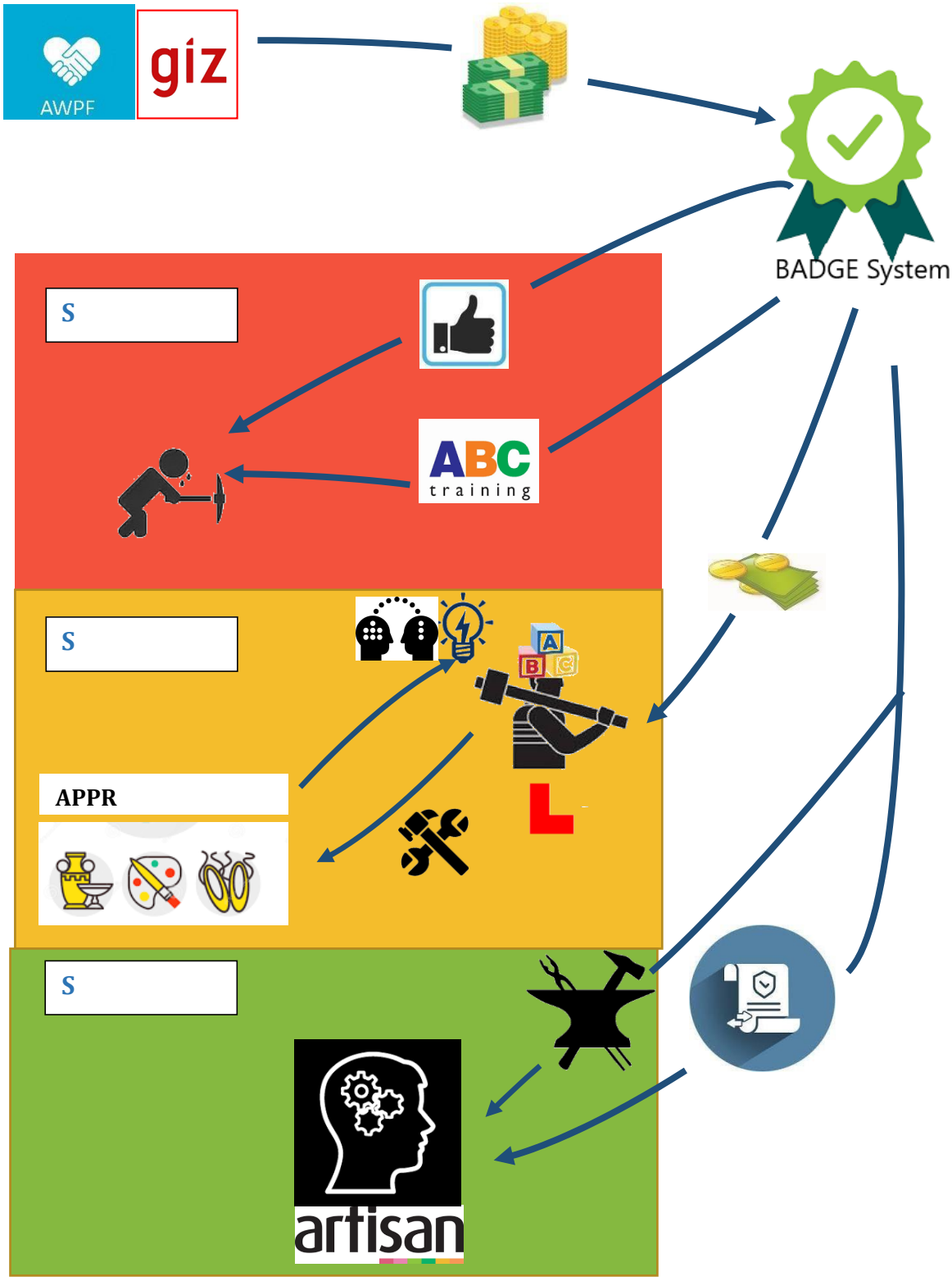
Burner boys, Illegal Lead smelter workers, Dismantlers of hazardous fractions

[45] The Knowledge Tree concept was developed as part of the GIZ Training Design Workshop (2-4.04.2019)

SWOT Analysis

Strengths	• Strengthens vision of Agbogbloshie being a Circular Economy based activity hub • Utilizes and showcases existing (traditional) artisanal skills and builds on those • Provides for reorientation of informal sector workers into new work areas that are more profitable, legal and generally more socially acceptable • Peer to peer apprenticeship learning model should be a very effective upskilling alternative adult education strategy • Proposed Makerbadge app will enable innovative tracking of evidence based learning and sponsored access to hives will link and expose informal sector participants to innovative thinking community
Weaknesses	• The proposed project is likely to be fairly costly as it requires: - An incentive for the artisans to take on learners - A compensation for the learners equal to the earnings from the (illegal) activity they used to do - Financial support to the participation hives and maker stations to allow free access of the learners to the hubs - Dedicated finances to develop the proposed Makerbadge, pay people to provide the information (artisans) required for the learning modules that it will entail • The project has limited social benefits regarding a narrow scope of potential beneficiaries. It does not promote gender equity in particular
Opportunities	• Maximum opportunity for advancement of informal sector based individuals (e.g. by acquiring new skills and by furthering their education). • Development of a Blue Print model in a pilot project format that can be relatively easy controlled and replicated elsewhere in Ghana • Creating a viable alternative for adult education that is affordable and provides technology based evidence of skills. Literally an electronic registry of capabilities and skills proven by embedded videos, interviews etc. that show the know how visually rather than being based on traditional written tests etc. • Involves knowledge hubs, maker stations and hives and gives them exposure and recognition of their innovation potential and showcases any products developed that can be embedded into the selection of unique Ghanaian arts, craft and utility goods.
Threats	• Might only benefit a few who leave their old hazardous occupations only to be replaced by a new generation of people that will fill their gap. Very likely to happen in the absence of legal enforcement. • Artisans not willing to share their skills because they do not want to grow their own competition.

“Badge System” Business Model



SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF SOME OF THE BADGE SYSTEM BUSINESS MODEL ICONS

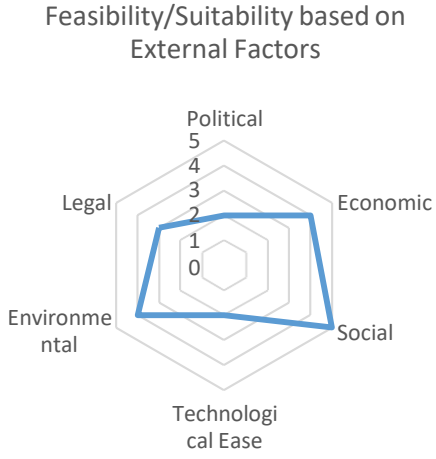
						
Agbogbloshie Worker Protection Fund in partnership with the GIZ	Reputation	Badge System	Basic Training (5 Learning Modules @ 2 hours each and captured with "Knowledge Passport" type badge	Unskilled worker sourced from target group	Learner apprentice also receiving education through the Knowledge Passport based training programme	Knowledge Transfer and Skills Development
						
Qualification/Right of Operation issued through the Badge System	Funding of required artisanal tools from badge system	Qualified artisan through the badged based education programme	Provision of free labour			

FUNCTIONAL COMPONENT HARVESTING

Background

The value recovery of "function" rather than only that of the actual "material" is one of key strategies for a much more optimized resource utilization on which the circulation of technical nutrients in the globally accepted Circular Economy model is based on.

Ghana, including the existing operations at Agbogbloshie and other metal scrap yards have a well-established and highly functional activity area around "component harvesting". The suggested business model seeks to optimize the potential income streams of (previously) badge system educated combined "testing and dismantling" service providers. They are meant to ensure that the potential for the recovery of any functional components is possible to promote subsequent refurbishment and/or repair replacement activities while ensuring that non-functional parts are safely dismantled and thereby de-polluted to harvest additionally the purest possible (and therefore high value containing) material fractions.



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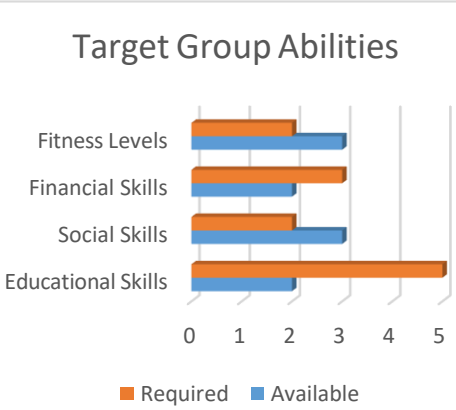
Description of the Component Harvesting Model

- The workforce of dedicated component harvesters needs to be developed though the GIZ (Badge-Based) educational training described in a separate character brief.
- A training module as part of the "Advanced Knowledge Tree" curriculum will be designed specifically to teach previously informal scrap metal recyclers how to conduct the required testing to identify functional components.
- The trained workforce will then be connected (via GIZ/KfW networking support) to both local product manufacturers or repair shops (using harvested components as input materials) as well as to formal recyclers who are organised in the wider Alliance network (see separate fact sheet).
- e-waste received for component harvesting could ideally be linked up with the suggested Green E-waste Channel initiative or from any other corporate sources (e.g. B2B).
- The Agbogbloshie informal work force benefits since a percentage of the sales/recycling proceeds from this events are earmarked to flow into the Agbogbloshie Worker Protection Fund.



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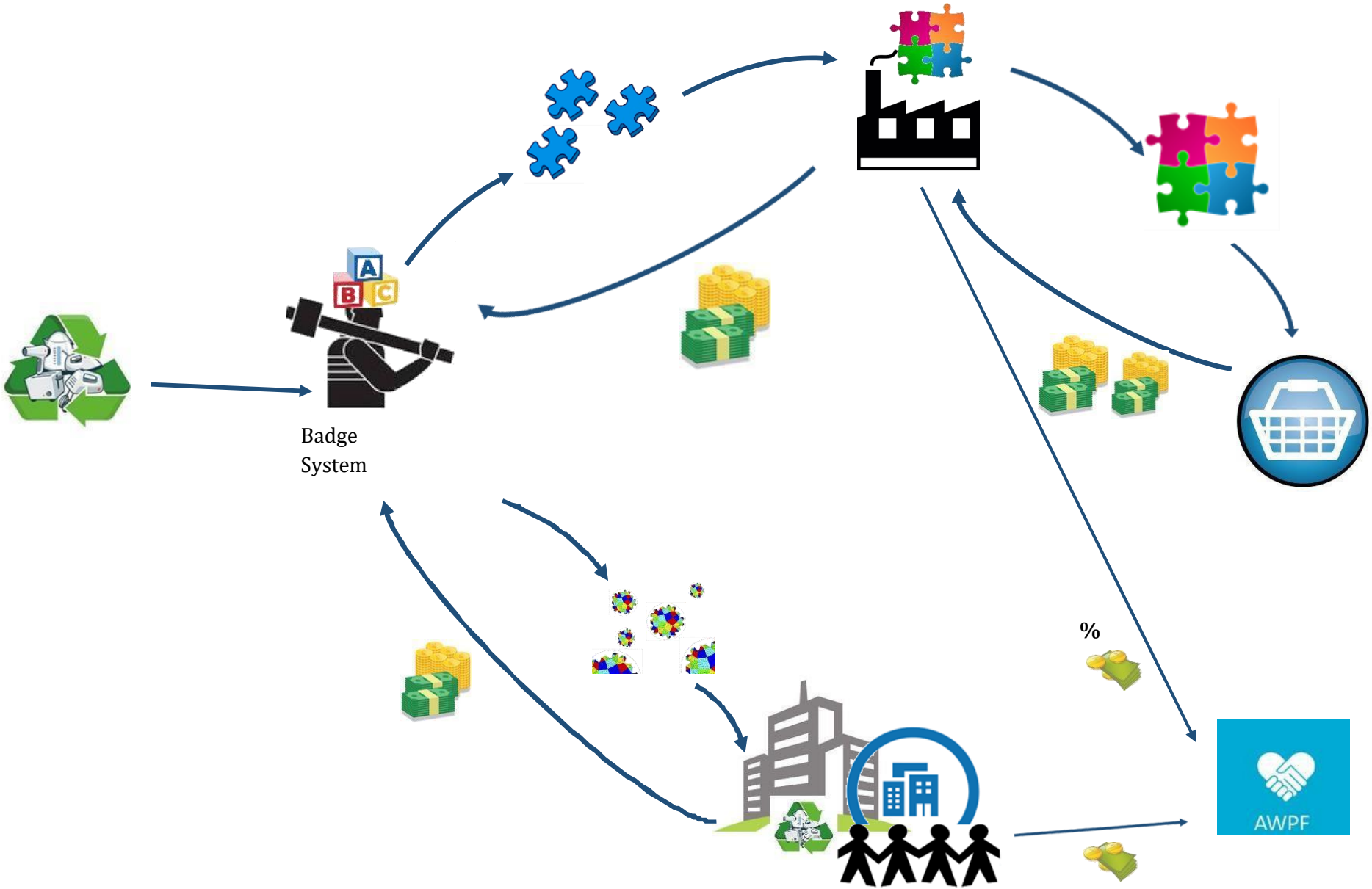
Key Target Group(s)

Targeted as the main beneficiaries are informal workers that will be trained to be skilled component harvesters.

SWOT Analysis

Strengths	• Recovery of function rather than materials preserves natural resources • Functional components can be sold at a higher value • The workforce for a “component harvesting” pilot project can be obtained through the development of a related training module as part of the Advanced Knowledge Tree curriculum under the envisaged Badge-Based Educational programme (see separate character brief) • Recovery of functional components going towards the maintenance, refurbishment and/or repair of EEE prevents the latter to become WEEE and also helps to provide more people with affordable access to EEE. • Ghana has already an established component manufacturing sector which would provide the required demand for components • From a social benefit perspective this initiative lends itself to active inclusion of women and/or physically disabled individuals as both the testing for functional components and manual dismantling for value fractions does not require the application on brute strength • Funding mechanism for the AWPF with two sources contributing to the latter (percentage of functional component recovery and from material recycling proceeds)
Weaknesses	• Based on a functional Badge-Based Education initiative • Requiring fairly sophisticated educational (e.g. technical) skills that needs to be funded possibly via GIZ/KfW for a pilot project set-up • Heavy reliance on functional and technically advanced testing equipment and systems • Possibly requires the GIZ/KfW to actively forge trading agreement between the component harvesting/dismantling work force and the suitable downstream buyers.
Opportunities	• Functional components can be locally repurposed e.g for alternative product manufacturing and through basic mapping of activities at the Agbogbloshie scrapyard it is fairly easy to facilitate industrial symbioses type work collaborations and related component/material trades
Threats	• No dedicated space for the testing equipment might be available hence concerns regarding the safety of high-value testing equipment being kept securely and in working condition. • Unwillingness to honestly disclose component sales and materials recycling profits leading to underfunding the AWPF

Functional Component Harvesting

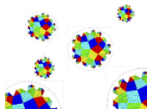


SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE BUSINESS MODEL ICONS

						
Badge-Based System trained workforce	Supporters, testing technology funders and overseers of the project	Functional component harvested after testing	Product manufacturer/refurbisher /repairer using components	Newly manufactured/refurbished or repaired product including harvested components	Consumer-any type: business or private or government	e-Waste
						
Agbogbloshie Worker Protection Fund	Money (more)	Money (less)	Value fractions from dismantling for material recovery	Alliance Service providers		

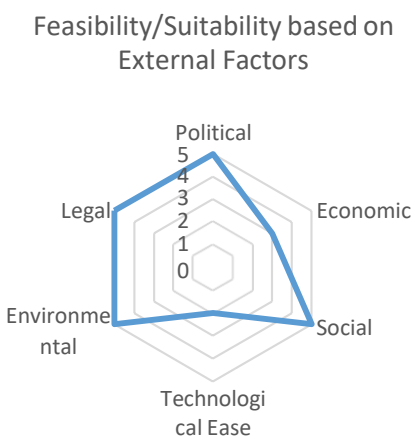
MECHANICAL CABLE STRIPPING IN A PILOTING PAYMENT SYSTEM

Background

The core idea for this business model is already piloted in Agbogbloshie through GIZ in partnership with the Oekoinstitut and powered through the unique MTN "Mobile Money" mobile phone app. The latter is used as the strategic software based centre piece that enables the piloting payment system as an alternative economic trading model for cable processors. It is the intention to expand the current use of the Mobile Money app in this particular activity sector and make it part of an Agbogbloshie wide larger pilot payment system that offers beyond mobile money also other value added services for both beneficiaries of the envisaged whole system and its contributors.

As such the ultimate aim would be an alternative financing model based on a unique localized, resilient and independent finance mechanism including strategic elements such as:

- *Proof of impact based design and development of projects*
- *Locally based accountable and committed key stakeholders driving the entire Piloting Payment System for Agbogbloshie*
- *Offering wider micro-lending and money safe-keeping services*



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Description of the Mechanical Cable Shredding

- Technologically appropriate and feasible cable shredding machinery will be made available at strategic locations in and around Agbogbloshie (as an expansion of the current pilot location) to BADGE System trained informal workers
- Usage of the equipment including the required energy to operate needs to be for FREE for any potential user and financed as a contribution through the Agbogbloshie Worker Protection Fund.
- Funds to operate and maintain the machinery as required will be dispensed via GASDA and based on a clearly documented needs/usage base (according to the proof of impact)evaluation model (see also www.proofofimpact.com)).
- GASDA will also report to Government and document any incidences of illegal cable burning at the same time and as part of the monitoring and evaluation along set Key Performance indicators for the project.
- Clean copper of cables that have been mechanically shredded will be bought by Alliance affiliated at price that will be slightly higher to contribute to the AWPF
- Payment for the shredded cable materials in MTN Mobile money

0=no; 5=high

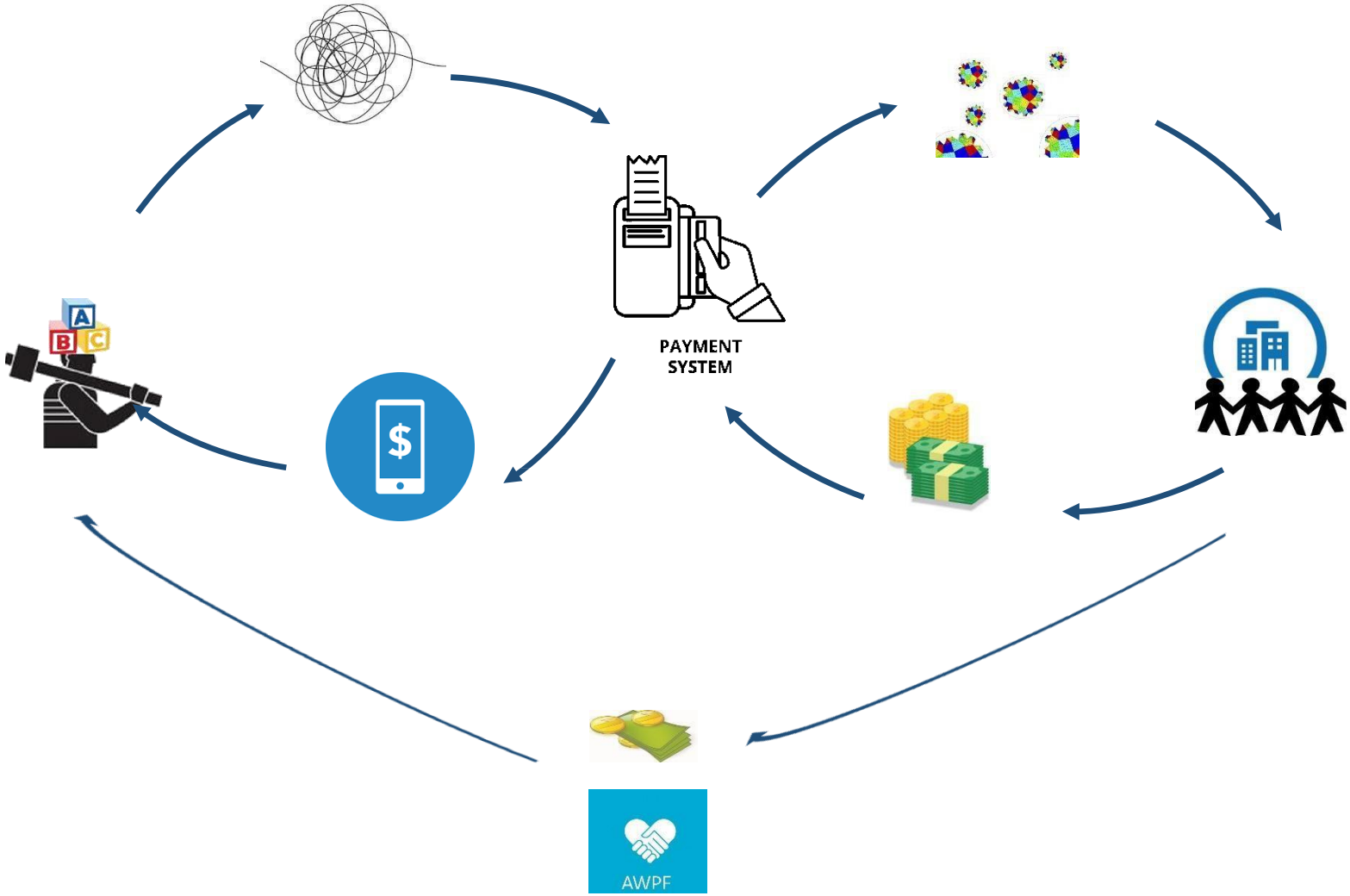
Key Target Group(s)

Former "burner boys"

SWOT Analysis

Strengths	• A very powerful intervention to stop any illegal burning of cables now and in future • Immediate radical environmental improvements • Protection of the Health and Safety of retrained burner boys • Build on an already existing mobile money system (MTN) • Safe means of payment with reduced danger of crime and theft • Widely used and accepted by informal sector representatives already
Weaknesses	• Reliant on active involvement of GASDA willing to report and monitor illegal burning incidences • Requiring Government authorities to actually enforce the law and issues fines to help to set the precedent and ultimate motivation for workers to switch • Cost for maintenance and electricity of machinery need to be covered and financed via a third party and • Alliance suppliers must be willing to pay a premium for unburnt copper plus release a contribution into the AWPF to promote the support of badge system trained workers and the operation of equipment.
Opportunities	• The cable treatment operations can provide the blueprint for the envisaged Piloting Payment System on which other activities can be included and that can increase the amount and types of services available as part of an alternative banking, financing and saving system for all people living and working in Agbogbloshie. • “Proof of impact” model working on linking up fundable projects with clear SDG outcomes, KPIs and uncompromising block-chain evaluation technology will maximize the confidence of potential funders to become involved and for the Alliance to support this initiative by financially contributing to the AWPF as a means of exposure and public recognition
Threats	• Lack of legal enforcement, bribery of both officials and GASDA members to keep a blind eye • Break down of stripping machinery that might be to complex or not completely suitable for the requirements at hand

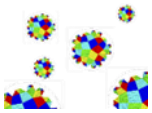
Safe Cable Treatment Through Introduction with a "Piloting Payment System"



METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

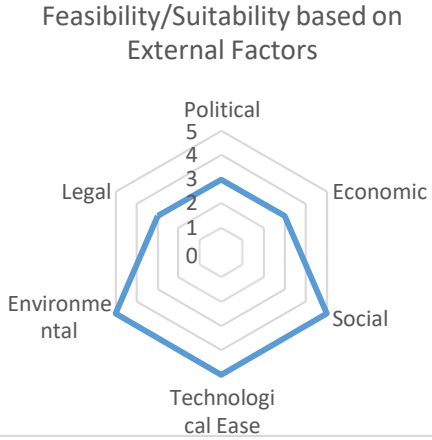
MEANING OF THE BUSINESS MODEL ICONS

					
Badge-Based System trained workforce	**Cables (copper and other constituents)**	**Fraction from cable shredding (copper and plastics etc.)**	**Alliance Service Providers**	**Piloting Payment System**	**Mobile money app**
					
Agbogbloshie Worker Protection Fund	**Money (more)**	**Money (less)**			

SWOP SHOPS

Background

The Swop Shop business model was developed and first introduced in Hermanus, South Africa in 2003 from where the blueprint was successfully replicated in other municipalities. While it was initially only aimed at providing a "hand-up" incentive for children to collect recyclables in their community after school hours (and therefore start recycling in their homes and clean up the natural environment from litter as well) the scope of some more recently established swop shops is to rather benefit women. Some swop shops have moved their core concept to only target women in informal settlements now because there was evidence that children started to skip school in order to rather collect recyclables for the local Swop Shop which is clearly not the objective of this initiative but rather an unintended consequence. Therefore, the Swop Shop model described further (and suggested as an alternative business model in Agbogbloshie and other hubs where recyclables are collected and managed) will only focus to benefit WOMAN who currently live and work in informal settlements.



0=no; 1=low; 5=high

Description of the Swop Shop Set-Up

- Swop Shops are typically hosted once a week by a volunteer organisation (NPO) in partnership with the local municipality and in close vicinity to the target informal community
- A Swop Shop is typically a container which is refurbished as a "store" where living essentials can be bought by the beneficiaries- women who collect recyclables.
- The goods available through a point-based (money-less) reward system are derived from local businesses in form of donations.
- Recyclables of all kinds are accepted once a week when the store is open at a recurring time and day and all recyclables received are sorted and weighed on site. Collectors are typically receiving some soup as well on the day. Points are allocated according to the weights received and any resulting waste is removed by the partnering municipality on the day.
- Recyclables are then sold on to the respective local recyclers for further processing who collect their fractions on the same day.
- Point credits can be either redeemed immediately on the day or saved for goods that are of more value by accumulating them over a few weeks.
- This teaches the basics of business trading skills and regular swop shop suppliers of recyclables can be identified and further empowered e.g. to enter GIZ supported entrepreneurship development training programmes or benefit from other reward and/or upliftment schemes.

0=no; 5=high

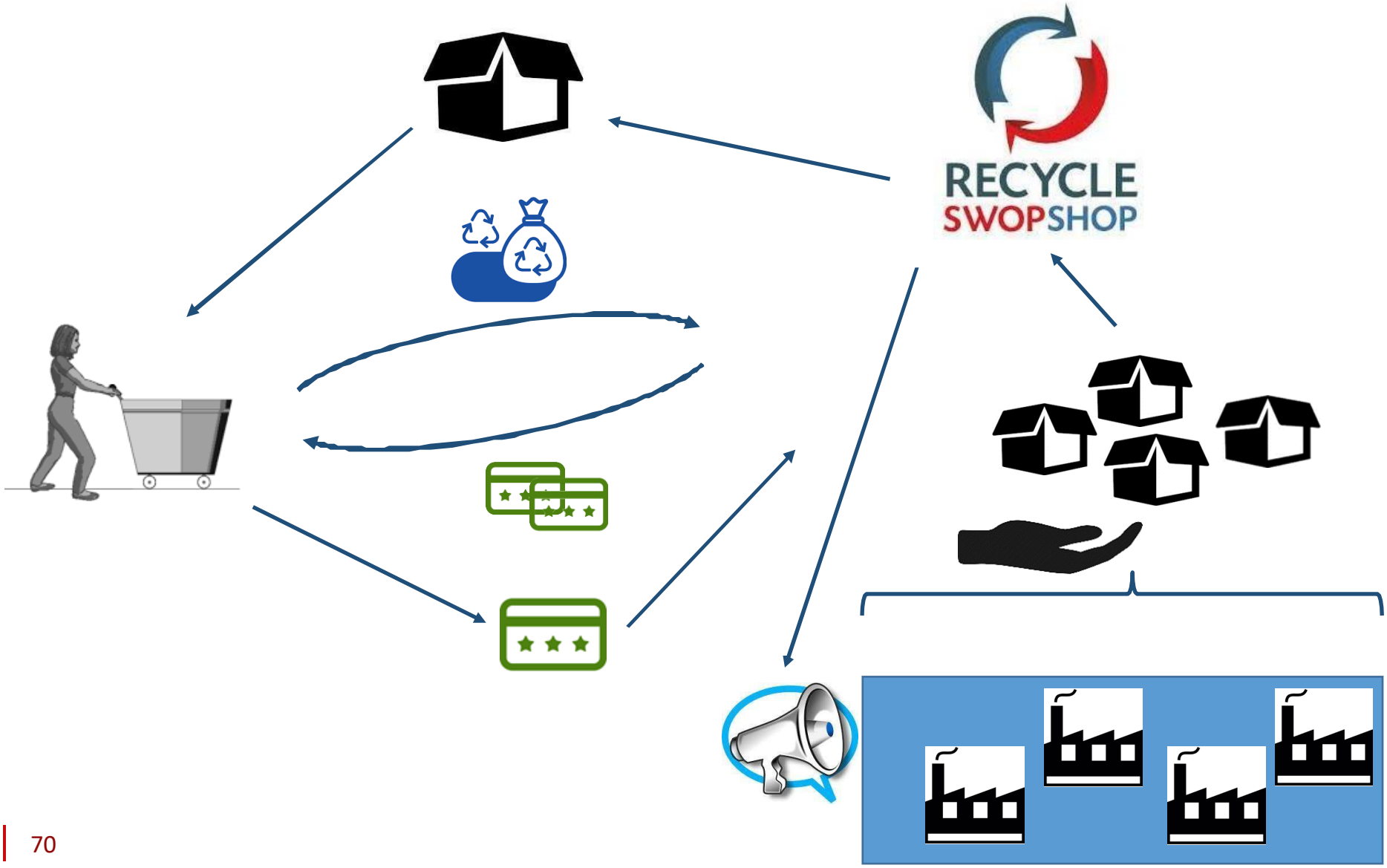
Key Target Group(s)

Adult women living and working in informal settlement areas

SWOT Analysis

Strengths	• An alternative income business model suitable specifically for women • Moneyless system • Easy to participate in addition to other employment activities (recyclables can be collected after hours e.g. many also in form of litter lying around) • Teaching basic business skills and offering many types of additional reward systems that can be added • Proven success model in South Africa • Can be also targeted as children as key or additional beneficiaries • Great CSR marketing potential for donors of Swop Shop stock articles • Wide type of articles suitable ranging from essential basic hygiene materials to food to clothing and could even include refurbished ICT in the case of Agbogbloshie.
Weaknesses	• Requires willingness and collaboration of Municipality to remove at no cost any resulting waste on Swop Shop collection day • Requires willingness of recyclers to reliably show up at Swop Shop day • Requires private sector donors willing to release surplus stock or otherwise suitable product as a donation • Dedicated staff is required in a voluntary capacity to plan, organise and facilitated the envisaged event on a weekly basis. In addition if food such as soup is handed out this requires even more preparation.
Opportunities	• Providing a one-stop take back service for all types of recyclables • Cleaner environments in and around the vicinity of a swop shop are a proven side effect • Basic public environmental education can take place on the back of such events next to business skills development
Threats	• Lack to establish a sustainable funding model solution for the envisaged Swop Shops • Unwillingness to participate in a scheme that does not offer direct financial rewards and compensation. • Children who skip school to benefit from a Swop Shop event and getting fed there. Men who try to muscle in and sideline women in their attempt to source recyclables.

The “Swop Shop” Business Model



SUMMARY AND KEY OF SYMBOLS USED

METHODOLOGY BASED

ORGANISATIONALLY BASED	VALUE CHAIN BASED	ACTIVITY BASED	OPERATIONS/TECHNOLOGY CHANGE BASED
			

MEANING OF THE BUSINESS MODEL ICONS

								
Female collectors	**Mixed material recyclables (glass, paper, plastics, metals etc.)**	**Goods of all sorts for the Swop Shop**	**Marketing and Exposure**	**Money-less point credit system**	**Local industries and commercial businesses**	**Donating**	**Swop Shop NPO structure**	

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