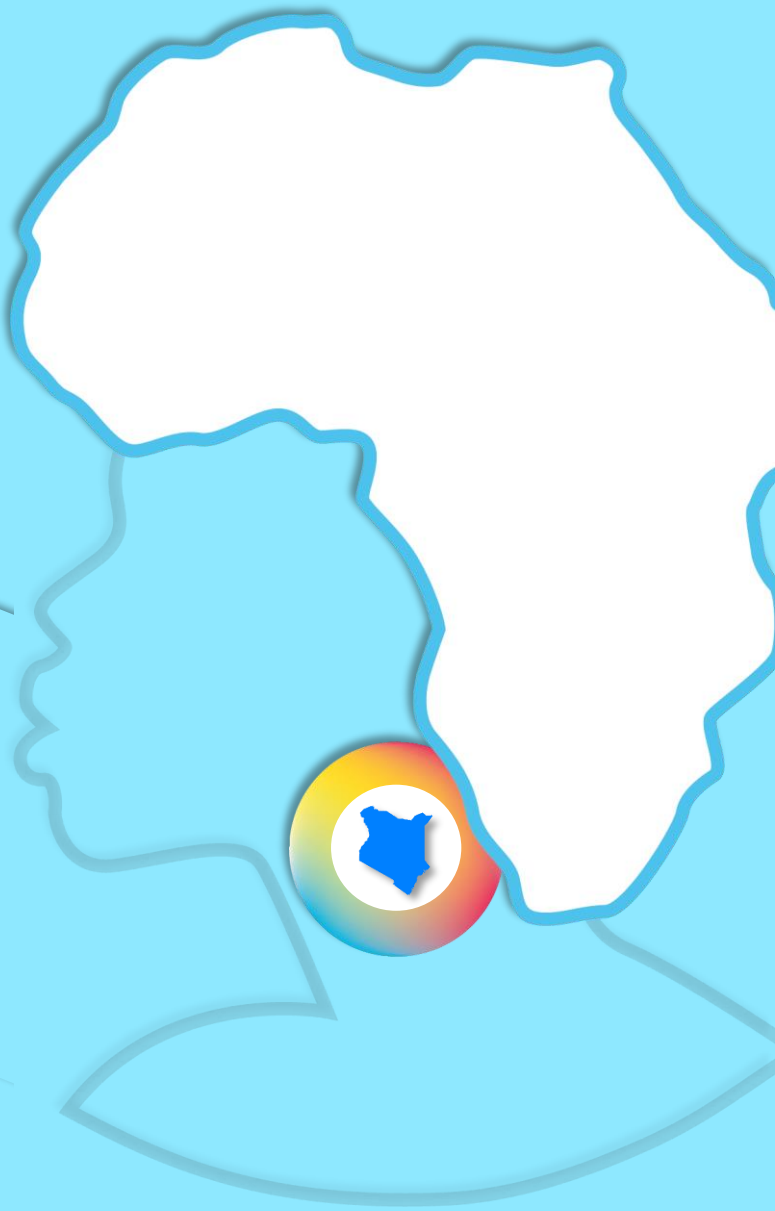
PROJECT

ASSESSMENT OF THE CURRENT STATUS OF THE CIRCULAR ECONOMY

of large house appliances waste



IN KENYA

MAY 2022, FACT SHEET

PROJECT INTRODUCTION

Kenya has seen a significant increase in the consumption of Electrical and Electronic Equipment (EEE). Unfortunately, many EEE eventually ends up as waste since proper end-of-life processing infrastructure is lacking. To address this challenge, The Netherlands Organization for Applied Scientific Research (TNO) with the support of Sustainable Inclusive Business (SIB-K), a knowledge Centre under the Kenya Private Sector Alliance (KEPSA), developed an action plan for a future-proof e-waste management system, focusing specifically on large household appliances (LHHA). The European Commission co-funded the study through the Climate Technology Centre and Network (CTCN). The study was implemented for one year (2021 – 2022).

The research was conducted using a cross-sectional design using a combination of qualitative and quantitative approaches. Primary and secondary data were collected through desk reviews, Focused Group Discussions, and questionnaires sent out to county governments , government agencies, e-waste management companies, Sellers and Distributors, Civil Societies and Repairers.

PROJECT OBJECTIVE

The study aims to develop an action plan to improve the circularity of large household appliances (LHHA) in Kenya, including the proposition for a pilot.

SCOPE OF THE STUDY

The Technical Assistance Response Plan was clear about the broad scope concerning circularity: it stressed the importance of so-called Value Retention Processes (VRPs) as an important driver for economic development and the prevention of environmental degradation. Therefore, the scope of this study explicitly extended beyond 'waste management' which is often regarded as the main activity when it comes to circular policies.

The study had a specific focus on Large Household Appliances (LHHAs). This comprised large cooling appliances, refrigerators, freezers, other large appliances used for refrigeration, conservation and storage of food, washing machines, clothes dryers, dishwashing machines, electrical cooking equipment, electric stoves, electric hot plates, microwaves, other large appliances used for cooking and other food processors, electric heating appliances, electric radiators, other large appliances for heating rooms, beds, seating furniture, electric fans, air conditioner appliances, and other fanning, exhaust ventilation and conditioning equipment.

THE CURRENT STATE OF LHHAs MANAGEMENT PRACTICES IN KENYA.

- The high value that LHHAs represent for consumers has resulted in an active repair sector and (partly) connected informal sector, that fulfills an appreciated function in dealing with goods and materials that are beyond repair.
- The scale of enterprises in the repair sector is generally small which hampers investments in equipment and knowledge building. From a business point of view, it will be advantageous to either increase volumes or (with the same goal) stimulate more intense cooperation between players in the value chain. This not only calls for collaboration among all stakeholders covering both the informal sector and the formal sector, but also for cooperation between and among counties, especially now that waste management is a responsibility at the county level.
- Separation at source is not common and this is mostly attributed to low awareness by the public on possible treatment methods for LHHA wastes as well as lack of infrastructure for segregation of LHHA waste.
- Repair of LHHA is a major Value Retention Activities (VRA) with operations at both formal and informal levels.
- There exists focus on materials recovery from used LHHAs that no longer can be repaired.
- Different techniques can be used for recycling of LHHAs, however, there are common steps that are applied for distinct appliances.
- The large household appliances that are most commonly used in Kenya are refrigerators, air conditioners, and washing machines.
- There is a inadequate collection centers for LHHA waste coupled with inadequate availability of transportation options.
- There is limited accessibility to spare parts , which impacts negatively the repair and refurbishment activities
- Currently there is no incentive for individuals to take their LHHA for treatment since the few existing LHHA waste collection and processing centers don't pay for the LHHA waste they receive.
- Practices such as dumping of LHHA in illegal dumpsites and burning in the open air still exists.

POLICIES AND INSIGHTS IN E-WASTE GENERATION AND PROCESSING

- There have been previous efforts to enact specific laws and regulations related to E-waste and LHHA in general which have since been shelved e.g. Draft EMCA (e-Waste) Regulations 2016.
- There are related legislation, policies and guidelines that, however not explicitly focus on LHHA, they provide a basis for sustainably managing LHHA including;

1. The Kenya Constitution 2010 gives the right to every Kenyan to a clean and healthy environment under Article 42. In addition, Article 69 obligates the government to eliminate any processes that are deleterious to the environment, including e-waste.
2. National e-waste Guidelines to assist the government, the private sector, learning institutions and other stakeholders to manage e-waste effectively for enhanced environmental conservation,
3. Environmental Management and Coordination (Amendment) Act (EMCA) 2015, which prohibits handling, transportation and disposal of waste without valid licenses issued by the National Management Authority (NEMA) and has designated e-waste as hazardous waste which require special handling.
4. Environmental (Impact Assessment and Audit) Regulations, 2019 and legal notice 31 of 2019 considers establishment of an e-waste recycling center as a high-risk project which must undergo a comprehensive Environmental Impact Assessment (EIA).
5. The National E-Waste Management Strategy 2019 is a five-year plan covering the period 2019/20 to 2023/24 providing elaborate strategies to achieve circularity of LHHA.
6. Procurement and Disposal Act 2015 which provides that public institutions have to invite competitive tenders for disposal of computers and other EEE as scrap in line with procurement procedures.
7. The third medium term plan (2018-2022) of Vison 2030 prioritize e-waste as an emerging waste category with an emphasis on support to SMEs to manage the waste,
8. National sustainable waste management policy 2019 which promotes waste segregation at source.
9. Proposed National Sustainable Waste Management Bill 2021. The Bill, if passed into law, will have organic and inorganic waste divided into three categories during disposal indicated by green, blue and yellow bins. Green dustbins will hold organic waste as blue bins carry re-usable waste. Hazardous waste, which comprises LHHA waste, will be disposed of in yellow bins.
10. Proposed EPR Regulations 2021. The EPR Regulations 2021 proposes the establishment of five categories of Producer Responsibility Organizations (PROs) to support producers, who are members of the PROs, in sustainably managing their products at their end-of-life. Under the five categories of waste, which corresponds to the PRO to be established, Waste electric and electronic equipment waste is features as among products that are subject to compliance of EPR scheme under schedule 1 of the proposed regulations.

BEST PRACTICES

1. In Ghana easy deconstruction manuals are distributed with the appliances, indicating how you can handle LHHA's in a safe way, both for human health and environment.
2. In Kenya GIZ and Waste Electric and Electronic Equipment (WEEE) Centre are working together to train youths on handling e-waste to promote sustainable management of e-waste and create employment for the many unemployed youths.
3. In Kenya, WEEE Centre has established collection centres for the varied e-waste in different counties. The WEEE centre also conducts regular E-waste drives in different parts of the country to create awareness about E-Waste as well as use the platform to collect waste from households.
4. Integral e-waste management in Rwanda.- The Ministry of Trade in Rwanda invested 1.5 million dollar in an e-waste handling facility through the Green Fund of Rwanda (FONERWA) in 2014. The facility is a subsidiary of a Dubai based company called Enviroserve and focuses on recycling and refurbishing of e-waste. It is Africa's second largest facility for handling e-waste9. There are supporting policies in place to ensure the facility operates properly. Enviroserve Rwanda has installed collection points specifically for e-waste where households can bring their appliances to. From these collection points spread over the country, the e-waste is transported to Enviroserve. Further separation takes place upon arrival at the facility itself. There the e-waste is separated, weighed and recorded. Enviroserve Rwanda can collect, sort, decontaminate, dismantle and recover components and materials that can either be further recycled or re-used. In first instance these materials are used locally. When this is not possible they are transported to international smelters that further treat them. The facility includes a Metal Baler and Plastic crushing and washing line. Such machinery would also be suitable for treating end-of-life LHHAs. Rwanda's Utilities Regulatory Authority (RURA) together with Enviroserve Rwanda and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) have developed a program to create awareness and they give technical training to the informal workers on e-waste in different districts.



Recycling Best Practices

Recycling processes focus mainly on the materials recovering from used LHHAs that no longer can be repaired. Different techniques can be used for recycling of LHHAs, however, there are common steps that are applied for distinct appliances. Below are schematic diagram describing best practices for recycling refrigerators, washing machines and air conditioners.

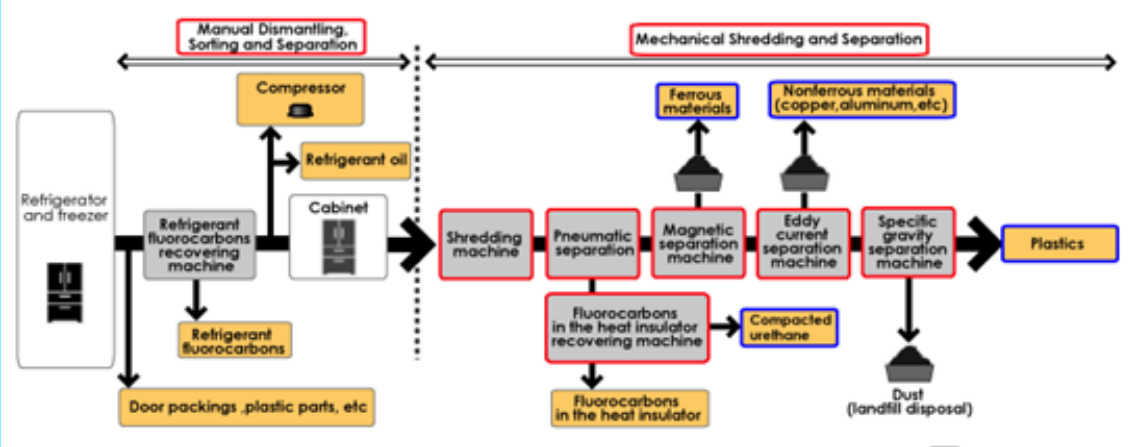


Figure 1: Recycling process of refrigerators (Source: https://www.aeha.or.jp/assessment/en/english_flame_rp.html)

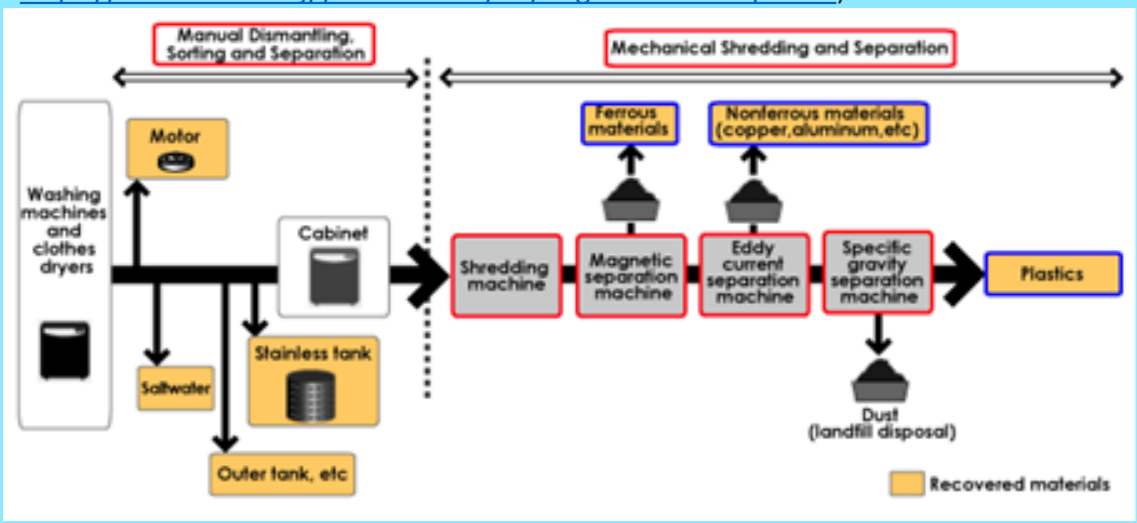


Figure 2: Recycling process of washing machines Source: https://www.aeha.or.jp/assessment/en/english_flame_rp.html

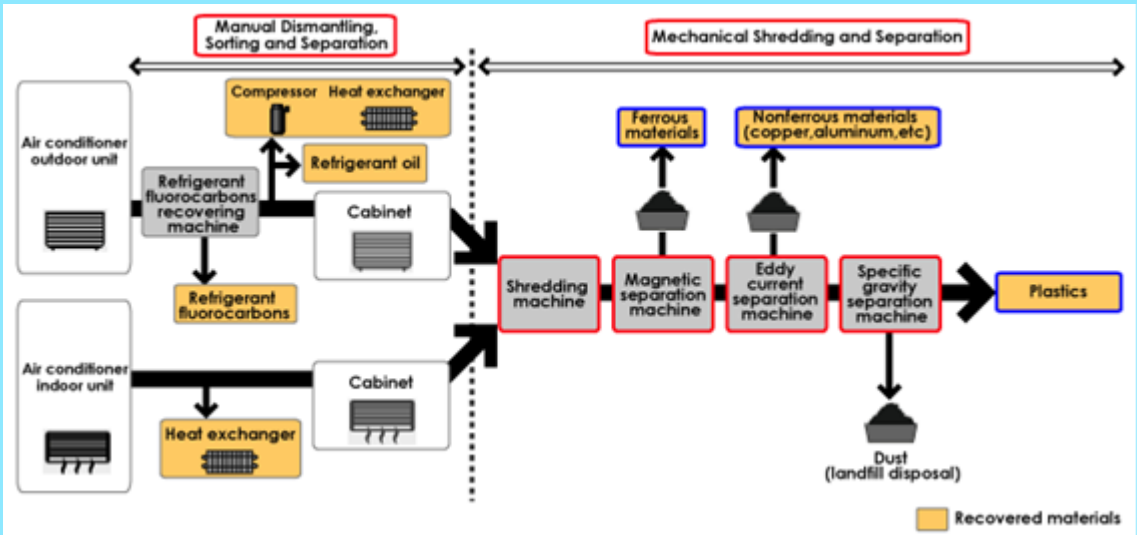


Figure 2: Recycling process of washing machines Source: https://www.aeha.or.jp/assessment/en/english_flame_rp.html

IDENTIFIED POLICY GAPS

POLICY GAPS	
Low policy implementation and enforcement.	Whereas the EPR regulations is not yet in force it's current provisions does not explicitly encourage takeback systems.
Inadequate policies to incentivize value retention activities for electronic waste	Public Procurement and Disposal Act 2015 is silent on consideration of the end-of-life effects of EEE procured and fails to provide further guidance in case the recyclers fail to bid for purchase of used EEE and e-waste.
Protection of the informal waste pickers is not clearly defined in protecting their interest as a key players in the waste value chain.	No specific regulation on electronic waste (long process in finalizing the draft regulations)

CONCEPTUALIZED PILOT PROJECT

To address the system gaps, a 5-phase approach was designed. This approach acknowledges the fact that every step is complex and that every step is required to develop the next step. Each phase is composed of different activities that target distinct stakeholders and elements of the overall value retention system. The proposed feasibility, so-called phase 0, could be set up as a concrete project, that could run for about one year

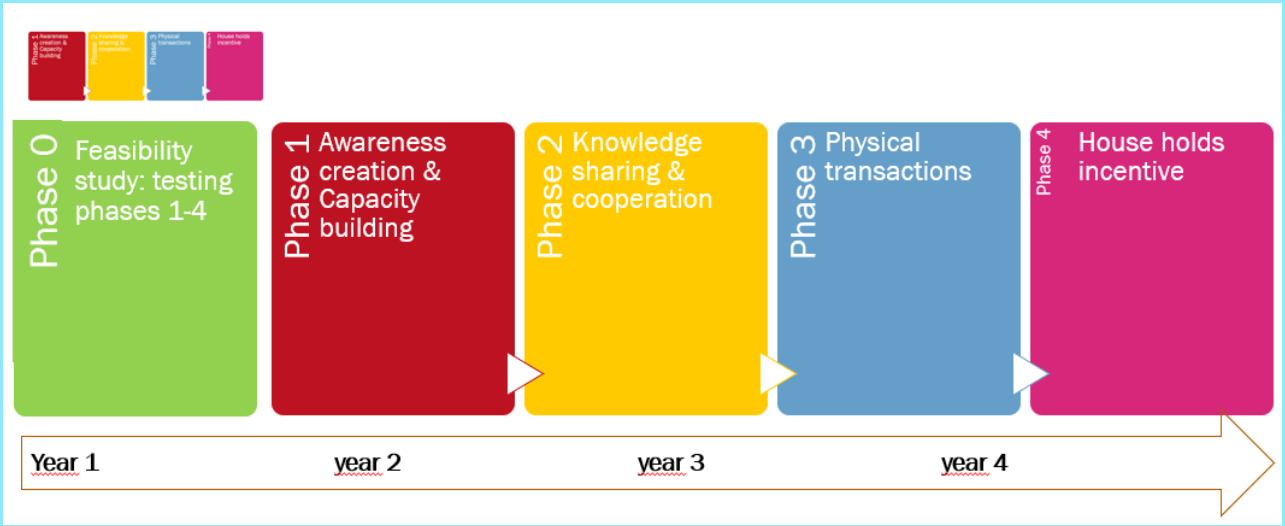


Figure 4: Schematic overview of the 5 phases of the pilot

In contrast, the 4-phased approach sketched below could easily require 3-4 years before reaching completion. Though the order of implementation of the complete 4-phase approach is fixed, the project-based execution of phase-0 could enable the project team to run the different steps in parallel. Regular meetings between the limited group that undertakes phase-0 ensures an open communication about the learnings from the various aspects of this feasibility phase.

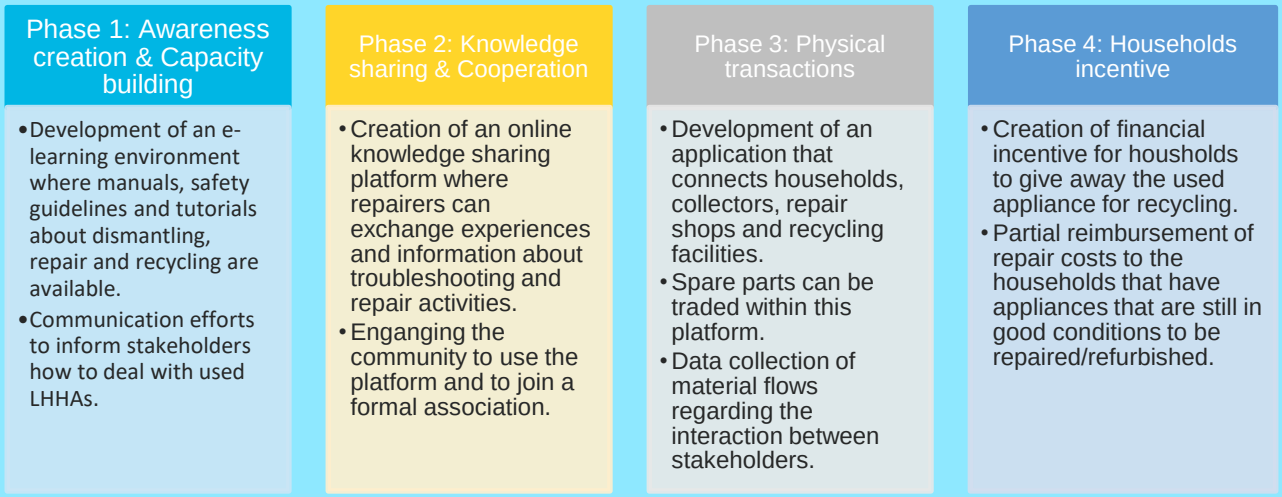


Figure 5: Schematic overview of the 4 phases of the full pilot

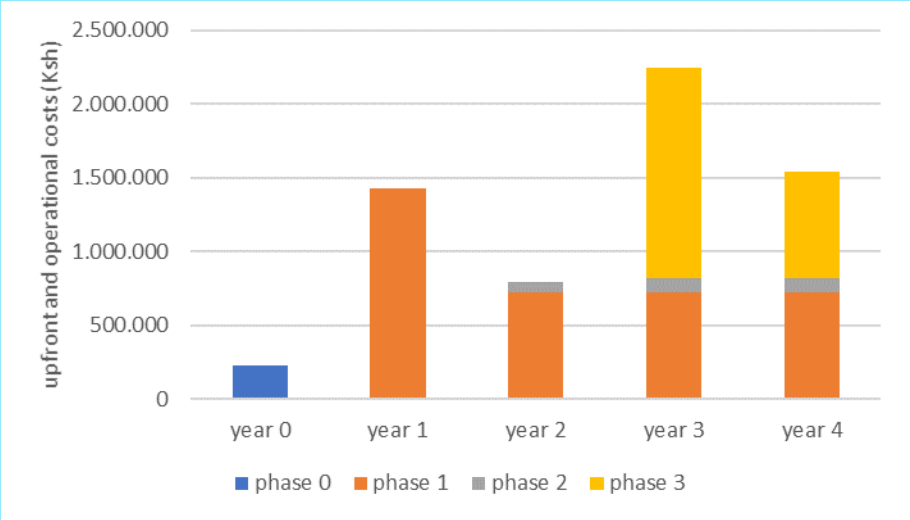


Figure 6: Total costs for the implementation of all phases of the pilot concept

These costs reflect the creation and maintenance of the web-based tools. Potential income, such as any possible charging fees from the users of each phase of the pilot (e.g. payment for e-learning training and membership fees for the accessing the knowledge sharing system), is not included in this budget. The income from the fees are not included because there are very dependent on the number of people using the platforms, which can vary along the years, therefore, difficult to estimate. However, the values in Figure 6 can serve as an initial indication on the resources needed to execute all phases of the pilot. The figures in this overview are based on the highest values in case ranges were indicated in the costs for each separate project phase.

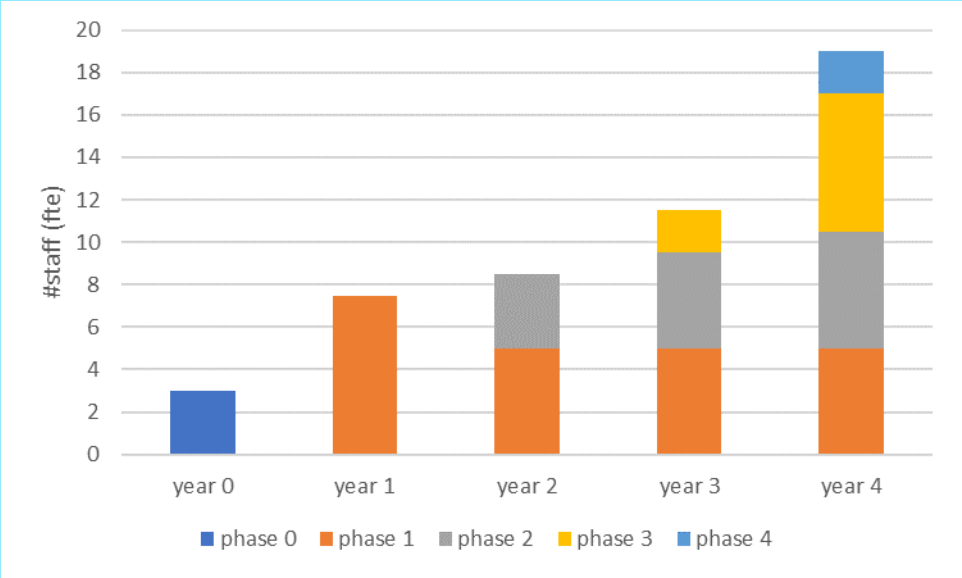


Figure 7: Estimated staff for the compete pilot concept

Given the step-wise development of the whole pilot the effort per phase is distributed over the 5 years of the pilot. In the final year of the pilot an estimated 19 full time employees (fte) are required for the execution of all the 4 phases that are then in effect. The feasibility phase-0 is only operational in year 1.

ANTICIPATED BENEFITS AND CHALLENGES IN EXECUTING CONCEPTUALIZED PILOT PROJECT

Benefits for each phase	Challenges for each phase
• Safer LHHA handling. • Standardization of activities (increase trust). • Since the training would be available online, the platform would be an opportunity for allowing more women to work in the field (training could be followed at home). • Less hazardous waste in the environment. • In Kenya certificates are valued extensively. Therefore, this would provide an incentive to follow such a course/training.	• The current scope (LHHAs) is rather narrow. However, it is possible to broaden this scope. This could be in terms of appliances included, e.g. expanding to ICT or maybe even general waste. • For designing manuals it is important to collaborate with manufacturers since they know best how the product is designed and how it can be safely dismantled. However, for some international brands, it is difficult to get manuals and spare parts, especially the less widespread brands.
• Strengthen network among repairers, refurbishers, and recyclers. • Inclusion of informal workers in the system.	• Competition between shops.
• Reduce improper disposal of LHHA waste. • Extended product lifetime. • Inclusion of informal workers in the system. • More data collection. • Improve accessibility to spare parts.	• Availability of recycling centers in the neighborhoods could limit the use of the app included in phase 3. • It is not sure whether the scope of LHHAs is broad enough to convince stakeholders to make use of such a digital platform. Maybe the scope should be expanded.
• Increase volumes of LHHA waste in recycling facilities. • Reduce improper disposal of LHHA waste. • Improve participation of households in the value retention system.	• Engaging households can be a lengthy process. • The procedure for the household to request the reimbursement/ give away bonus has the risk of becoming too bureaucratic and demotivates the households to apply for it. • Funding for the implementation of such activities might be challenging.

STRATEGIC NATIONAL ROADMAP

The purpose of this roadmap is to give directions and recommendations on how Kenya can transition toward a circular economy, with a focus on proper management of the End-of-Life of LHHA.

The roadmap, towards optimizing the current way in which LHHAs are dealt with during and after use, should comprise the following elements:

- Policy development, implementation, and enforcement.
- Increasing knowledge, awareness, and safety.
- Increasing (inclusive) collaboration.
- Enhance value retention processes

ROADMAP VISUALIZATION OF THE CURRENT PRIORITIZATION

ROADMAP 2030

Long 2027-2030

- Enhance infrastructure
- Enhance value retention processes
- Improve cross-sectoral collaboration
- Prepare and foster human capacity building

Medium 2024-2026

- Improve awareness on LHHA management Include the informal sector
- Create jobs for women and young entrepreneurs
- Capacity building
- Knowledge sharing
- Increase collaboration and alignment between county and national governments
- Include the informal sector

Shot 2022-2023

- Implementation of EPR policies: capacity building Improve inter-institutional collaboration
- Designing an EPR scheme Increase public awareness and information availability/sharing
- Additional policy instruments to enhance circular activities and EPR
- Enforcing and evaluating the EPR scheme and other policies
- Increase data availability

- **Domain:**
- Policy development, implementation, and enforcement.
- Increasing knowledge, awareness, and safety.
- Increasing (inclusive) collaboration.
- Enhance value retention processes.

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