



Innovate E-Waste



Recycling of Copper at Agbogboshie

Phase I: Research and Fact Finding



Obed Yaw Abotsi
Team Leader
E-Waste Paradise

INTRODUCTION

Through the collaboration of Creativity Group, Recyhub and Agboglobshie Makerspace (AMP) based on a Memorandum of understanding between Creativity Group and Recyhub, the E-Waste team of Creativity Group-KNUST lead by Obed Abotsi and his team of Emmanuel Nkrumah, and Mathias Nyaka began working on designing and prototyping of copper recycling machine to be use at Agboglobshie E-waste dump, the biggest E-waste site in West Africa. This copper recycling machine will be use by these local recyclers to help improve their working conditions and also help reduce air pollution among other pollutions.

OVERALL WORK PLAN

- **Phase I: Research and Fact Finding** – Through user centered design approach, this phase will begin with trip to Agboglobshie to interact with the targeted users and experience their current recycling methods first hand. We will also establish direct communication with local recyclers to continually involve them in the entire process; from design to prototyping.

We will also pay a visit to AMP to directly involve them and learn from them as our first and major partner from the current situation at Agboglobshie, suggested approach, appropriate design and technology and implementation approach.

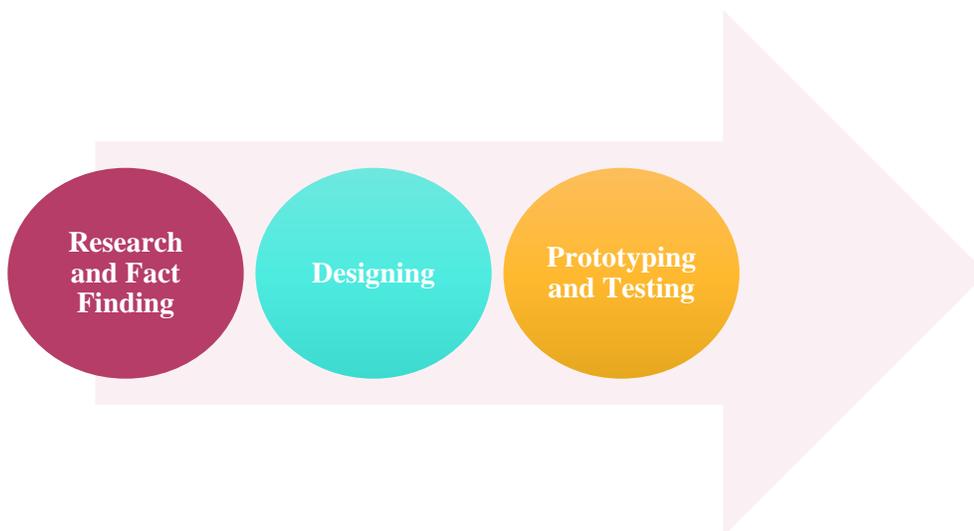
Expected Outcome: A decision of the basic machining approach of prototype either stripping or shredding of the copper

- **Phase II: Designing** – This phase will involve designing and model a copper recycling machine based on data, inputs and the facts obtained from the previous phase. The approach will still be a user centered and appropriate technology.

Expected Outcome – Various design perspective including detail drawing of prototype, 2D and 3D modelling.

- **Phase III: Prototyping and Testing**- This phase will involve constructing and prototyping of the copper recycling machine. The phase will be completed with the appropriate testing and taking feedback from targeted users

Expected Outcome – A Copper Recycling Machine prototype



REPORT ON TRIP TO AGBOGBLOSHIE

Members who went to Accra:

Obed Yaw Worlanyo Abotsi- Team Leader

Emmanuel Nkrumah - First Member

Mathias Nyaka - Second Member

Team met at engineering gate at 1:00am, 31st January, 2015 and picked a taxi from Campus to Asafo (VIP bus station). Bus left Kumasi at 3:00am and arrived in Accra at 8:00am. Team then moved to Agbogbloshie, project site, via public Transport.

Team quickly located site for burning of copper at Agbogbloshie and moved there. Team interacted with individuals who burn copper to understand how, why and reason for burning wiring containing copper by interviewing some of them, and taking pictures and videos for evidence. We got to know that they sell 1 pound (weight measurement) of copper for GH¢ 3.70.

Team moved to Las Palmas restaurant via transport for lunch at 12:00pm. Team then moved to Accra hub after leaving restaurant via transport. Team met a member of AMP, Dk, at 2:00pm as planned. Dk gave us a lecture on AMP and what they have done so far in Agbogbloshie and how our project together with theirs would help improve the E-waste system in Agbogbloshie. He also suggested that we focus more on designing a copper stripping machine rather than a copper shredding machine. Dk explained the concept of copper shredding machine and described the machine as non-robust, hence not favorable for Agbogbloshie. He ended his talk by suggesting many things we should consider when coming up with our design for this project. Team departed the Accra hub at 5:00pm.

Team leader, Obed and second member, Mathias funded their transport to their homes and back to school the next day. Emmanuel, first member was given the remaining amount of money left to travel back to school. This decision was taken because, Obed and Mathias live in Accra, hence their homes can accommodate them, but Emmanuel lives in Kumasi.

CHOOSING COPPER STRIPPING MACHINE

Based upon research study conducted by team and advice from Dk, team concluded on choosing copper stripper machine. Some advantages of the copper stripping machine are;

1. It is environmentally friendly, i.e. no burning is involved hence environmental problems and hazards from burning of copper wiring is avoided.
2. It is a faster and efficient way of obtaining copper.
3. Plastic insulators obtained from stripping copper sheathing can be segregated for recycling.
4. Copper obtained from copper stripping machine would weigh more as compared to copper obtained from burning.

OVERVIEW OF COPPER STRIPPING MACHINE

Machine utilizes a cutter to directly rip off an opening on the surface of the insulator so that the copper wire in it is brought out. Machine usually has different shaped wire input holes and sizes for meeting varied of copper wire stripping.

FINANCIAL REPORT

FUNDS RECEIVED

Money Received for Phase I - - **GH¢174**

REPORT ON EXPENSES DURING MEETINGS

1 hour of Café time at Vodafone Café, 26th January 2015- **GH¢2**

1 hour of Café time at Vodafone Café, 28th January 2015- **GH¢2**

TRIP TO ACCRA

Taxi fare from Campus KNUST to Asafo (VIP Bus Station) - **GH¢ 10**

Bread, water and drinks for Journey to Accra- **GH¢ 10**

Ticket for Bus, from Kumasi to Accra (3xGH¢25) - **GH¢75**

Gave GH¢ 10, to person who showed us around and made interview people at burning Site at Agboghloshie

Lunch at Las Palmas restaurant (3xGH¢5) - **GH¢15**

Transport within Accra (From VIP bus station to Agboghloshie, from Agboghloshie to Las Palmas Restaurant, from Las Palmas Restaurant to Accra hub) - **GH¢ 20**

Team gave GH¢30 to Emmanuel, for transport back to VIP bus station in Accra and back to School- **GH¢30**

Obed and Mathias funded their transport to their home from Accra hub and back to school the next day (2xGH¢30) - **GH¢60**

Total Amount spent on Project so far - **GH¢234**

Receipts



*** We are still compiling the rest. We will update them soon.*