GOGLA
The Voice of the Off-Grid Solar Energy Industry

Swedfund

GOGLA e-waste Toolkit

Module 2
Design for reduction of e-waste

16 April 2019

www.gogla.org

Design for reduction of waste

Aim of the Module

Equip companies with the tools and knowledge needed to reduce the volume of e-waste generated.

Various approaches span across a wide spectrum, from **design for durability** to **design for recycling** to **full circular design**. This module will look at these principles and explore tangible practices with case studies from companies.

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Agenda

5 min	Welcome & introduction
10 min	Presentation: Circular design principles applied to electronics supply chain.
5 min	Poll question
45 min	Panel discussion • Design approaches to reduce waste • Tamper-proofing vs repairability: mutually exclusive or compatible.
15 min	Q&A
10 min	Call to action and wrap-up

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Speakers: Presentation

Miquel Ballester

Fairphone

Co-founder, Resource Efficiency Manager

Source: Fairphone

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FAIRPHONE

Change is in your hands.

In 2013, Fairphone became a social enterprise that is building a movement for fairer electronics.

FAIRPHONE

Being part of the system, to change it from within.

By making a phone, we want to create impact in four key areas

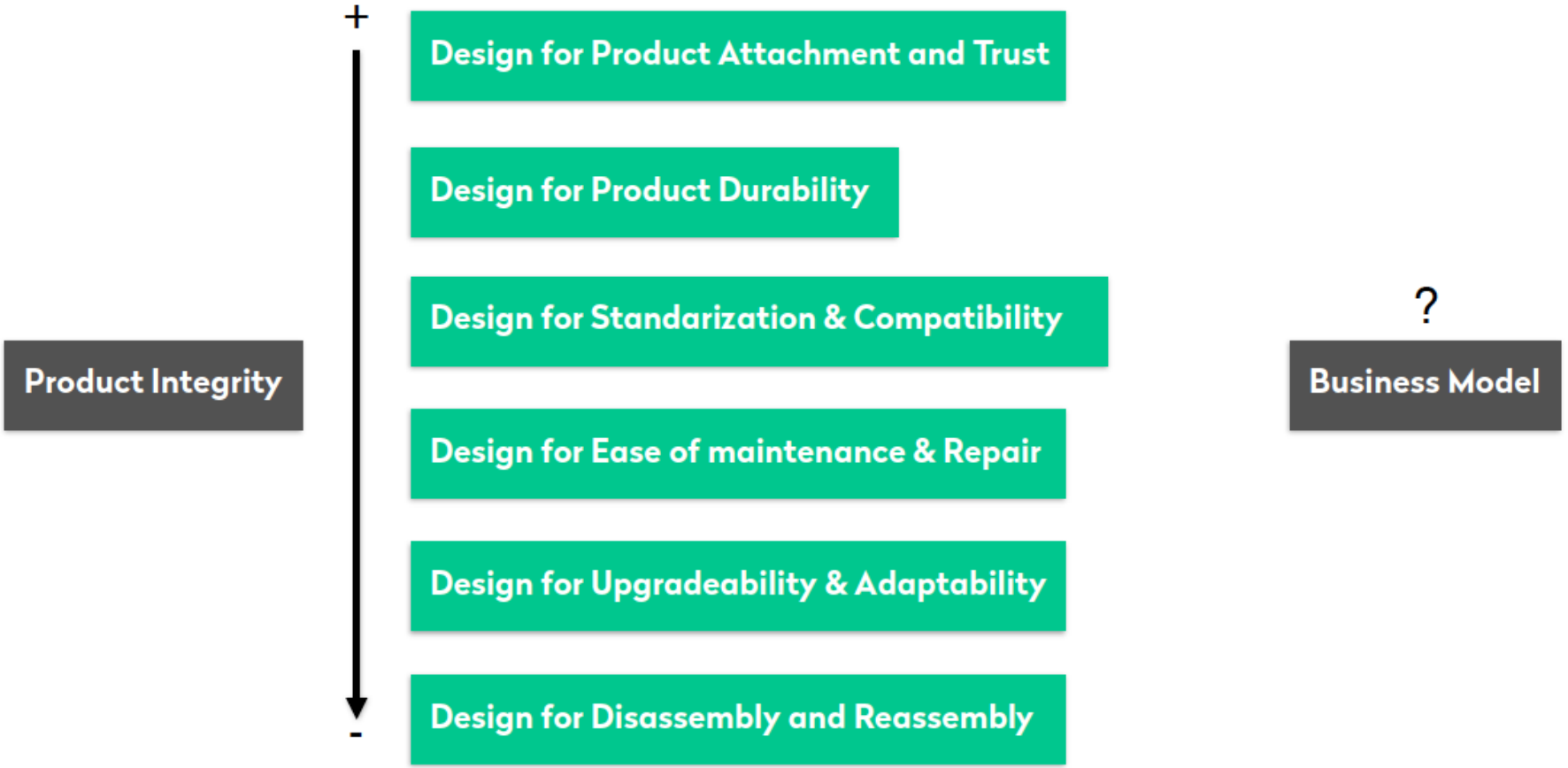
FAIRPHONE

Fair Materials

Long-Lasting Design

Good working conditions

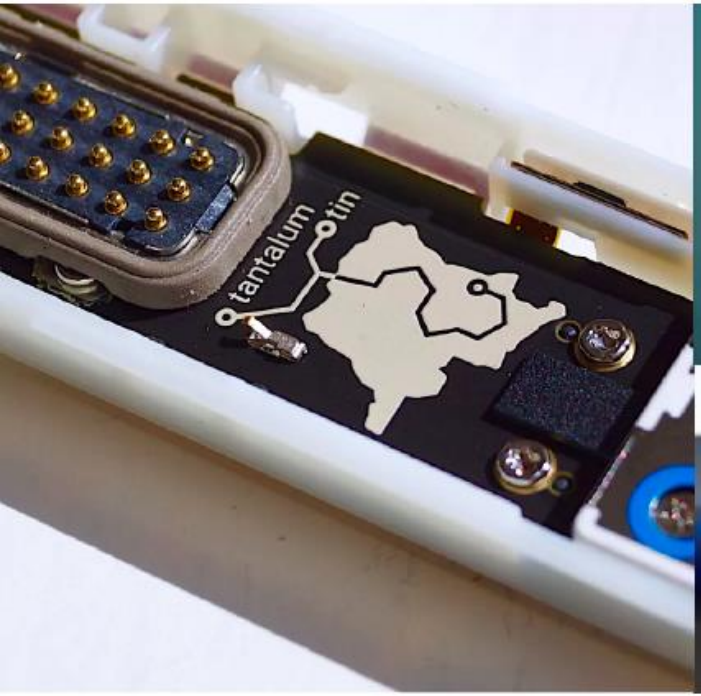
Reuse and Recycling



Products that Last: Bakker et al, 2014

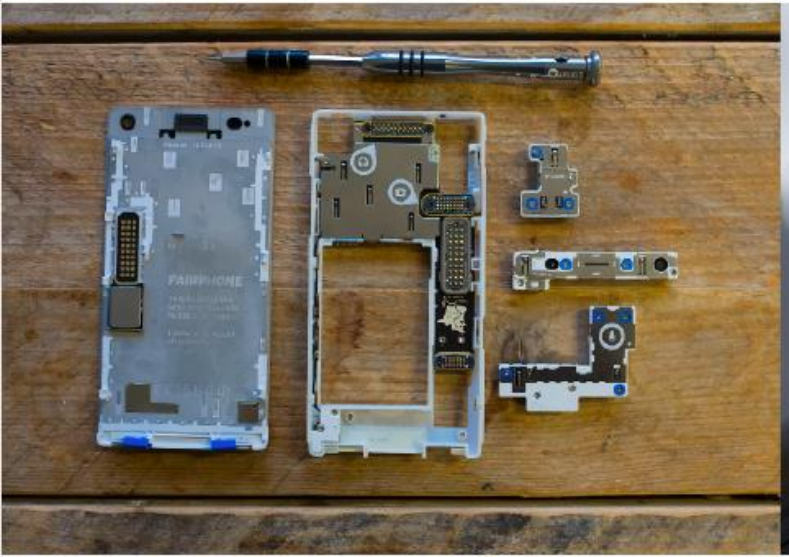
Design for Product Attachment and Trust

- Develop user touch points that help generate bonds to the physical product
- Have a product that is reliable and fulfills its purpose.



Design for Product Durability

- Slow down wear & tear of cosmetic parts
- Avoid failure after repeated insertion - removal of moveable parts increasing construction and connection durability.

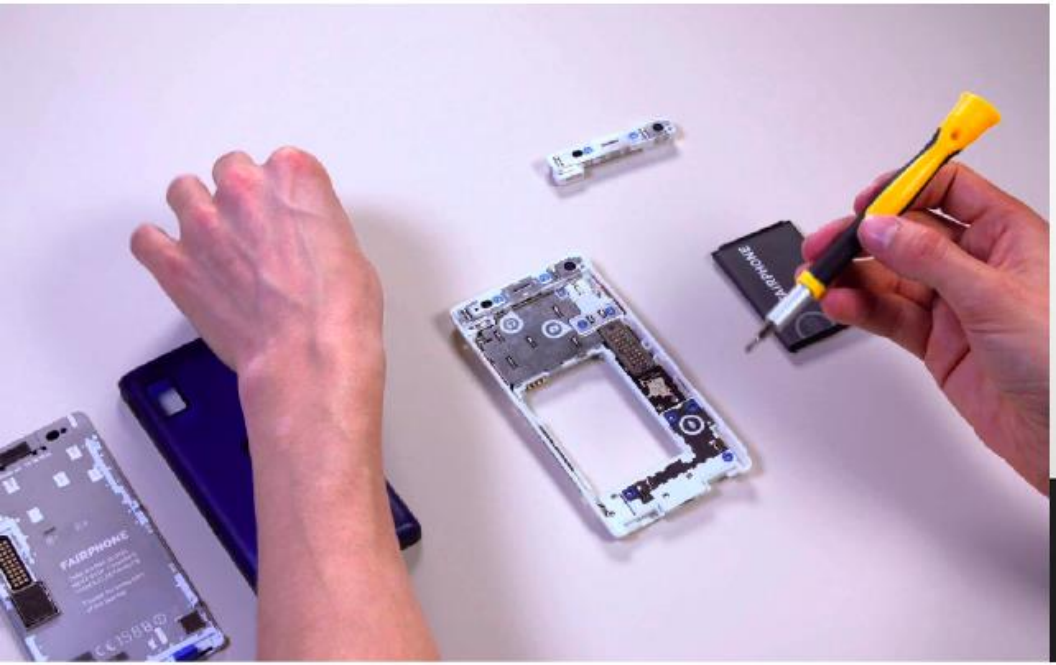


Design for Standardization & Compatibility

- Develop products that are compatible with other different product or that its parts are usable with other products.
- This gives a multifunctional character that may trigger a longer life use.

Design for Ease of maintenance & Repair

- Develop products that are easier to maintain and repair over the different stages of the life cycle and by different actors (ie. users, repair centers)



Design for Upgradeability & Adaptability

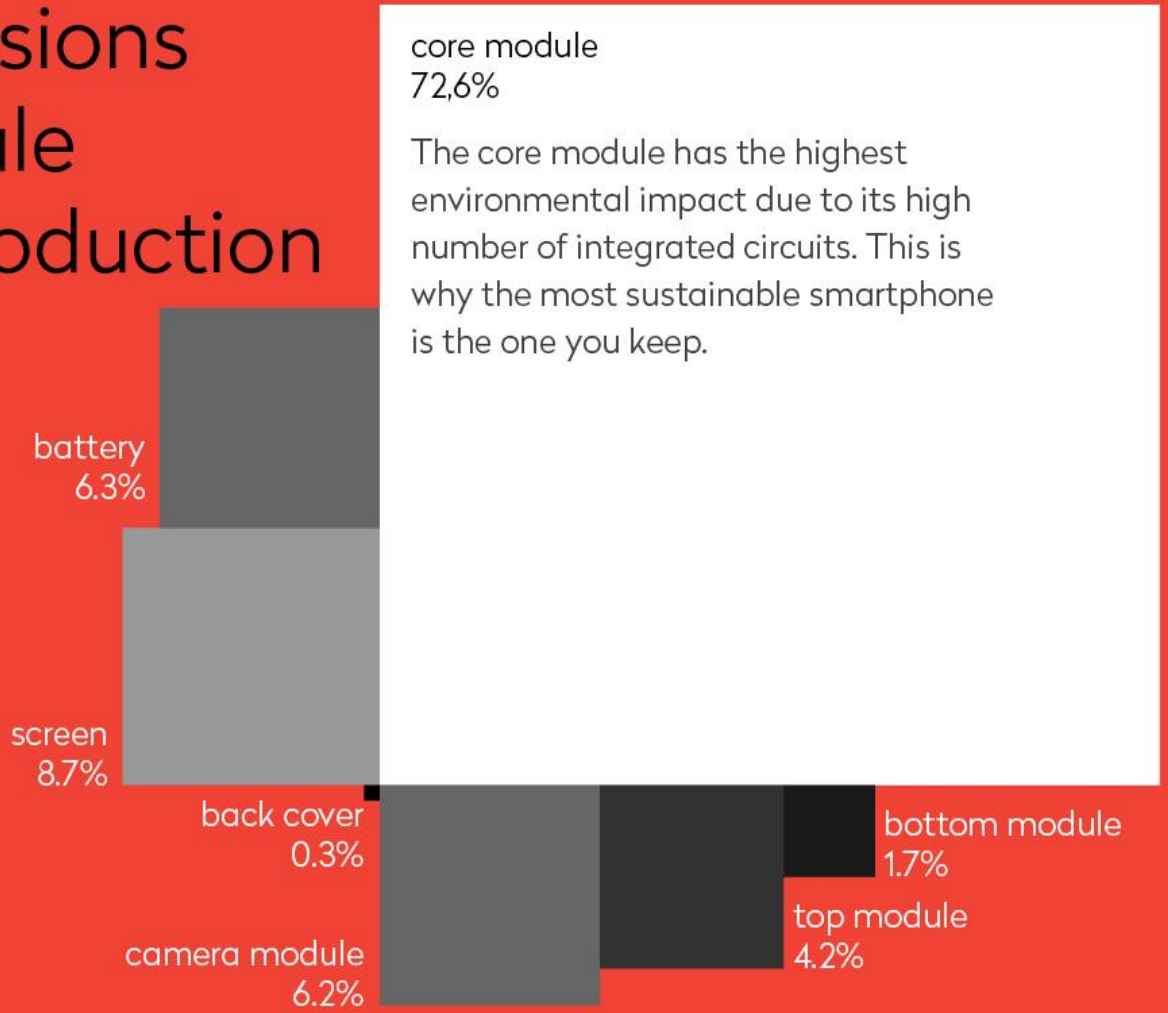
- Develop products that are easy to upgrade in functionality so that they stay market relevant and value for users stays as high as possible.

Design for Disassembly and Reassembly

- Develop products that consider disassembly and reassembly during the use life of the product.

- This is in general less relevant in smartphones as they don't need to be disassembled during their life (i.e. furniture that needs to move to another house)"

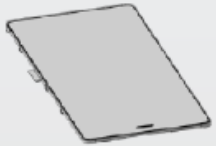
CO_2 emissions per module during production



Motherboard

Side Key Assembly

Display Module

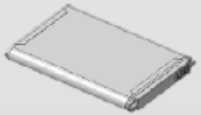


Speaker Module

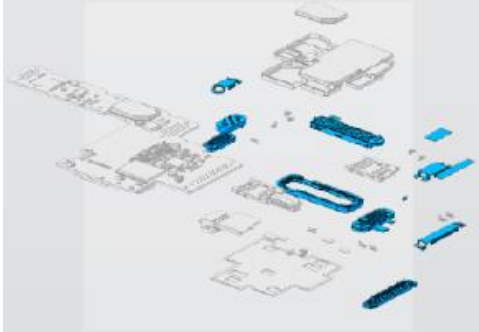
Camera Module

Receiver Module

Battery

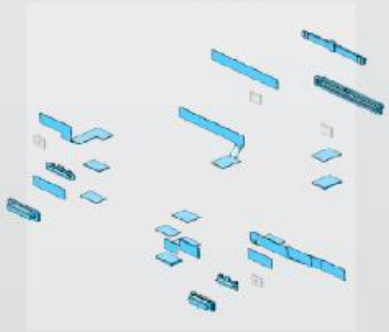


Motherboard



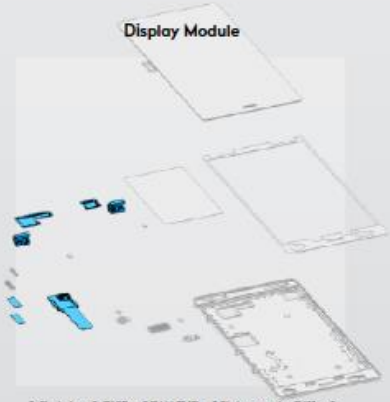
plug: 953.824mm3, battery connector: 130.55mm3, display connector, plastic: 287.045mm3, shield: 19.299mm3 30x pogo pin: 30x 2.384mm3 rubber: 84.556mm3 shield: 112.958mm3 camera connector plastic: 125.27mm3 shield: 14.039mm3 shield: 16.868mm3 shield mylar: 4.992mm3 22x pogo pin: 22x 1.57 mm receiver connector plastic: 108.788mm3 shield: 14.026mm3 shield: 20.119mm3 shield mylar: 6.775mm3 22x pogo pins: 22x 1.57 mm speaker connector plastic: 80.639mm3 shield: 10.262mm3 shield mylar: 13.216mm3 8x pogo pins: 8x 1.57 mm3 expansion pin plastic: 126.818mm3 2x pogo pins: 1x 2.385mm3 2x screw insert: 2x 6.065mm3

Side Key Assembly



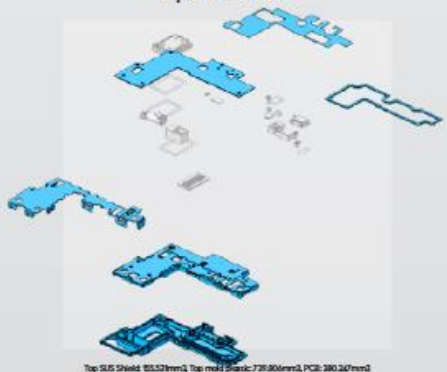
power key flex: 12.662mm3 solther: 1.53mm3 solther: 1.04mm3 solther: 1.82mm3 solther: 1.836mm3 foam: 5.508mm3 foam: 7.65mm3 adhesive: 0.94mm3 adhesive: 0.912mm3 plastic key: 22.68mm3 volume key solther: 5.04mm3 flex: 17.10mm3 solther: 2.04mm3 foam: 4.12mm3 plastic key: 45.307 mm3 camera key flex: 8.454mm3 solther:3.93mm3 solther foam: 4.59mm3 rubber: 8.078mm3 plastic: 19.187mm3

Display Module



2x Plastic clamp: 2x 136.767 mm3, Shield: 37.457mm3, Display con gasket: 19.688mm3 2x Shield clamp: 2x 1.368mm3, PCB: 260.277mm3

Speaker Module

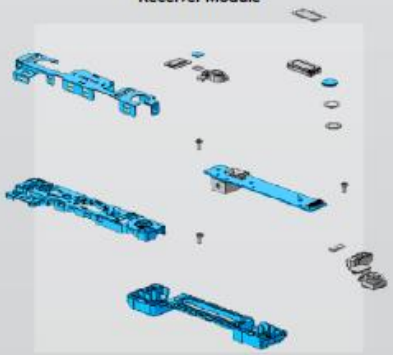


Top SUS Shield: 155.521mm3, Top mold plastic: 739.806mm3, PCB: 280.267mm3 Blossom mold plastic: 167.823mm3, 2x m1 screw insert: 2x6.065mm3, 2x m1 screw: 2x 7.466mm3

Camera Module

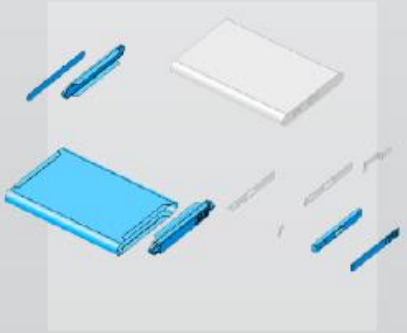
SUS Plate: 86.614mm3, Camera Cover: 622.12mm3, m1 screw insert: 6.065mm3, m1, screw: 7.466mm3, PCB: 126.487mm3, Gel CAM Shield: 99.514mm3, 2x Springs: 2x0.606mm3, 2xm1x20 Screws: 2x10.481mm3

Receiver Module



Top SUS Shield: 144.232mm3, Top mold plastic: 793.437 mm3, glass lens: 14.32mm3, LED Diffuser: 2.19mm3, 3x m1 screw insert: 3x 6.065mm3, 2x m1 screw: 2x 7.466mm3, Blossom mold plastic: 1097.197 mm3, PCB: 245.195mm3

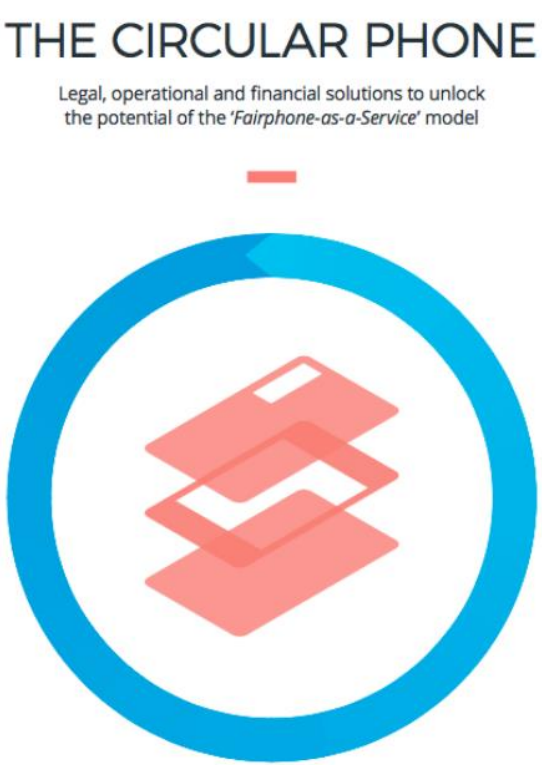
Battery



Plastic frame top: 81.261mm3, PCM: 84.792mm3, PCM Holder: 106.708mm3, Label: 590.562mm3, Plastic frame top: 247.166mm3, adhesive: 16.457 mm3, Adhesive: 10.461mm3

Ensure that the intrinsic value of the phone stays as high as possible for as long as possible.

- Lower costs
- Easily manage repairs
- Always have working devices
- Reduce end-of-life worries



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Change is in your hands.

miquel@fairphone.com

Poll questions

Design for reduction of waste

Which design strategy most closely matches that of your company?

A) Design for product attachment and trust (1 vote)
B) Design for product durability (6 votes)
C) Design for standardization and compatibility (1 vote)
D) Design for ease of maintenance and repair (5 votes)
E) Design for upgradeability and adaptability (1 vote)
F) Design for disassembly and reassembly (0 votes)

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Speakers: Panel

Nigel Preston

Azuri

VP Product Management

Anne Wacera Wambugu

Strathmore University

Quality Manager – Laboratory Engineer

Kondja Conrad

Solarworx

Chief Strategy Officer

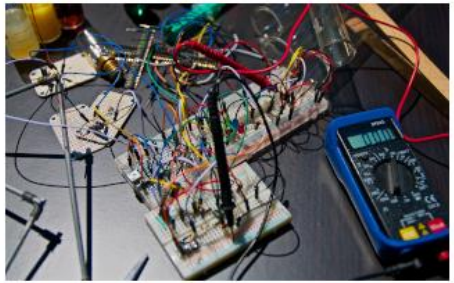
GOGLA

E-Waste Toolkit

Off-grid solar is delivering huge social impact to customers, mitigating greenhouse gas emissions from traditional polluting lighting sources, and supporting economic development in low-income countries. As the sector grows, companies and investors are increasingly focusing on resource efficiency and lifecycle of products – from design and manufacturing to end of life. In this hub, you will find resources aimed at helping address the main challenges in setting up sustainable recycling chains. This toolkit is a work in progress and content will be added regularly as modules are developed.

Introduction to Recycling

Module 1 is a high-level technical understanding of how each component is recycled and where to begin with identifying recycling partners. Learn more



Design for Reduction of E-Waste

Module 2 will focus on waste reduction strategies within the off-grid solar sector, looking at circular design principles and how they can be applied. ***Coming soon***

Financials of Solar E-Waste

Module 3 will look at the financials of solar e-waste by breaking down its supply chain, identifying where the costs lie and who is responsible for them. ***Coming soon***

Catalogue of Service Providers

The aim of this Catalogue is to help off-grid solar companies identify e-waste management companies, recyclers and other service providers. It presents a list of companies, a description of their services, country of operation and contact details.

We have started with a few entries but need your help to populate. Find it on the member section of the e-waste Hub.

Call to Action – please share any new listings.

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Next steps

Module 3 Overview to share with WG	End of week
Module 2 Briefing Note and online materials	End of April
Module 3 seminar	Tentative date: 2 May

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GOGLA
E-Waste Festival

Nairobi, Kenya

3 days of e-waste meet & events

- Business models & partnerships
- Ideation sessions for e-waste projects
- Visit to e-waste dismantling and battery recycling facilities
- Global LEAP awardees meeting (TBC)
- Kenyan Policy Engagement Sessions

Save the date:
Tue July 16th, 2019

Side Events
Wed July 17th, 2019
Thu July 18th, 2019

Solar e-waste Challenge: Grant Fund Opportunity

The solar e-waste challenge will disburse **$1 million** in grant funding to support off-grid solar e-waste innovation in sub-Saharan Africa.

The challenge fund will support companies to pilot and scale innovations that enhance the repair, refurbishment, collection and recycling of products. Grants will be available for:

1. **Recycling and e-waste management companies** seeking to expand business activities in the off-grid solar sector.
2. **Off-grid solar companies** seeking to pilot and scale e-waste operations.

The application window is March 7 – May 19 2019. More details about the objectives, eligibility requirements and implementation will be shared on March 7. Please contact Sam Grant (sgrant@clasp.ngo) for further information.

CLASP is managing the program under the Efficiency for Access Coalition - with support from USAID and in partnership with GOGLA.

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USAID FROM THE AMERICAN PEOPLE

EFFICIENCY FOR ACCESS

clasp

In the headlines yesterday...

Guinness announced they will stop using plastic packaging on their multi-packs.

Environmentalists welcomed it as a stout move.

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