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SOLAR E-WASTE CHALLENGE PROJECT SPOTLIGHTS

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GLOBAL LEAP AWARDS

EFFICIENCY FOR ACCESS | GOGLA | clasp | SCALING OFF-GRID ENERGY: A GRAND CHALLENGE FOR DEVELOPMENT

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SOLAR E-WASTE CHALLENGE PROJECT SPOTLIGHT

WEEE CENTRE

Conducting national awareness raising and increasing capacity for collection, refurbishment and recycling of off-grid solar products.

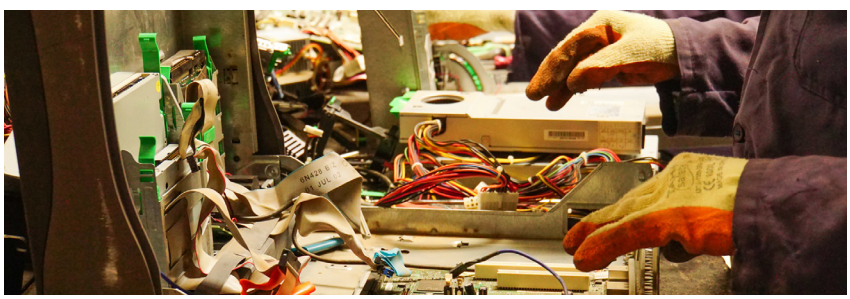
WEEE Centre will conduct a national awareness raising campaign, grow institutional capacity and work through dispersed community youth agents to collect, refurbish, and repair end-of-life off-grid solar products across Kenya.

Mismanagement and improper disposal of solar e-waste materials through dumping, burning, burying or disposing in water sources like lakes and rivers can result in negative environmental and human health impacts. Soil and water pollution, especially in rural off-grid communities that rely heavily on farming, can have substantial long-term impacts. Without dispersed and widespread collection points and repair shops, solar customers must either dispose of their products or transport them to urban centres for repair.

Through the Solar E-Waste Challenge, the WEEE Centre will focus on collection, refurbishment and recycling of off-grid solar products, The Centre will conduct a nationwide awareness campaign to increase public knowledge on the importance of solar e-waste recycling and existing e-waste collection points. The Challenge project will create strong linkages with companies in the region to act as the designated facility for disposal.

Over the life of the project, the WEEE Centre aims to:

- Raise public awareness & stakeholder engagement on e-waste disposal and recycling
- Expand the facility's processing capacity
- Directly employ 40 WEEE Centre employees and indirectly employ over 1,000 youth involved in collection, refurbishment and pre-processing of solar e-waste
- Prepare batteries for the market



AT A GLANCE

Project Location(s)

Kenya

Organization Type

Recycling Company

Focus

1. Extend product and component lifespan

2. Enhance product repairability

3. Facilitate more efficient product refurbishment, reuse or repurposing

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SOLAR E-WASTE CHALLENGE PROJECT SPOTLIGHT

ENVIROSERVE RWANDA

Establishing e-waste collection points in all 30 districts in Rwanda & developing a tracking system to optimize logistics and streamline communication with users for e-waste

This project aims to establish solar e-waste collection points in each of Rwanda's thirty districts and neighboring country border points (Uganda, Burundi, DRC) to access rural and hard-to-reach customers. Enviroserve will also build institutional capacity to repair, refurbish and recycle solar products and batteries.

Rwanda has set an ambitious goal to achieve universal electricity access by 2024 with 52% grid-connected solutions and 48% off-grid solar technologies. The rapid growth of the off-grid solar sector in Rwanda presents an opportunity for reuse and refurbishment of products and a challenge for waste management. Widespread, dispersed collection and repair points will play a critical role in not only ensuring Rwandans have access to sustainable, clean energy solutions but also institutional support when the products fail or reach their end-of-life.

Through the Solar E-Waste Challenge, Enviroserve Rwanda will establish collection points to serve all thirty districts of Rwanda and neighboring countries. Alongside the collection points, Enviroserve will run a nation-wide awareness campaign to encourage companies and consumers to bring their products to the points. The Challenge project will also train young graduates to become e-waste collection and repair agents, create a software tracking system, and invest in growing the facility's reuse, refurbishment and recycling capacity for off-grid solar products.

Over the life of the project, Enviroserve Rwanda aims to:

- Develop a collection system that covers 100% of Rwanda and can collect 70% of e-waste from solar products in the immediate region
- Design a software dashboard and tracking system to provide logistical optimization and efficient communication with product users
- Conduct a nation-wide consumer awareness campaign targeting solar companies and users to educate them on proper disposal and location of collection points
- Establish a battery storage system that can recharge and refurbish batteries collected from off-grid solar products
- Increase facility processing capacity through the procurement of a bulb eater, cable stripping process, and plastic conversion system

AT A GLANCE

Project Location(s)

Rwanda, Burundi, Democratic Republic of Congo, Uganda

Organization Type

Recycling Company

Focus

1. Product Repair, Refurbishment, Recycling
2. Second-life battery usages
3. Take-back and collection

Partner(s)

Carnegie Mellon University-Africa

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SOLAR E-WASTE CHALLENGE PROJECT SPOTLIGHT

D.LIGHT

Implementing a consumer awareness campaign and incentive scheme to increase take-back of faulty and end-of-life solar products in Kenya.

The project aims to increase collection of faulty and EoL quality and non-quality verified products. d.light Kenya will conduct a consumer awareness campaign and offer a discount on solar-lights as an incentive for consumers to trade-in their products with company field agents and in retail shops in Nyanza and Western provinces.

There is an assumption that off-grid solar customers are often hesitant to relinquish their faulty and EoL solar products, believing that they may hold residual monetary value. Additionally, anecdotal evidence suggests that non-quality verified (non-QV) products reach EoL sooner than verified products. Non-affiliate products, which make up an estimated 71% of pico-solar sales globally, do not come with warranties and manufacturers do not take responsibility when they reach EoL. A negative experience with one product could affect a customer's perception of the technology more widely.

Through the Global LEAP Awards Solar E-Waste Challenge d.light Kenya will test this assumption through a widespread consumer awareness campaign to encourage customers to bring their faulty and EoL products to d.light collection centers. By providing a significant discount on a quality-verified product, d.light seeks to overcome and negative perceptions that may exist due to bad experiences with non-affiliate products. Through the project, d.light will also collect data on the types and quantities of QV and non-QV products in Kenya and test incentive schemes for customers and field agents.

Over the life of the project, d.light Kenya aims to:

- Encourage households with non-functioning solar products to exchange them for a new, quality-verified, d.light product, rather than returning to traditional sources of energy for illumination
- Establish collection points for non-functioning solar products at d.light experience centers and regional distribution locations in Kenya
- Test the efficacy of word-of-mouth over radio advertisements as a means of encouraging consumers to return solar products
- Collect data on types, quantities and usage of returned products solar devices

AT A GLANCE

Project Location(s)

Kenya

Organization Type

Solar Company

Focus

Take-back and Collection

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FENIX INTERNATIONAL

Developing a comprehensive incentive scheme to retrieve off-grid solar lead acid batteries from the informal sector.

This project aims to collect broken non-Fenix components and lead acid batteries from informal sector workers/scrap dealers for proper recycling. Fenix will develop a comprehensive incentive scheme to buy-back the batteries and map out the informal sector in Uganda and Zambia.

Improperly disposed lead acid batteries cause soil contamination and contribute to lead exposure and poisoning. These batteries are considered the weakest link in solar home systems and pico-solar products, they are usually the first to breakdown. The increasing demand for lead has attracted stakeholders across the recycling landscape to participate in different processes in the chain: collection, dismantling & recovery and refinement.

The majority of lead acid battery recyclers are unlicensed and operate in dangerous environments without formal training in recycling. Developing sustainable e-waste management solutions requires engagement with informal sector actors and the establishment of formal processes. Through the Solar E-Waste Challenge, Fenix will utilize their last-mile presence to facilitate collection of non-Fenix components, especially batteries, in close collaboration with the informal sector. They will develop a competitive incentive scheme to purchase the batteries from scrap dealers and map out the informal sector landscape to optimize engagement.

Over the life of the project, Fenix aims to:

- Develop and implement a comprehensive incentive structure for lead acid battery buyback
- Collect 15 tonnes of e-waste and forward for safe recycling and disposal.
- Rollout the pilot in Central and Eastern Uganda and Zambia

AT A GLANCE

Project Location(s)

Uganda & Zambia

Organization Type

Solar Company

Focus

1. Take-back & collection
2. Enhance product recycling

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SOLIBRIUM SOLAR

Developing a tracking & mapping e-waste database to inform a buyback model in Western Kenya.

The project aims to address the lack of information on e-waste locations, quantities and actors in Kenya. Solibrium Solar will partner with local government to develop a database and tracking system and pilot a take-back model to increase off-grid solar product and battery reuse, refurbishment and recycling.

The growth of the off-grid solar sector in Kenya has led to increasing concerns over e-waste levels in the region. In rural Western Kenya, lack of information on types, quantities and locations of solar e-waste poses a significant barrier to e-waste management efforts.

Through the Global LEAP Awards Solar E-Waste Challenge, Solibrium Solar will partner with local government to track and quantify e-waste levels in Kakamega County. The tracking system will enable Solibrium to develop and target a take-back/buy-back model to extend the lifespan of solar home systems and pico-solar products. Additionally, their project will employ an expandable battery management system with Lithium (LiFePo4) batteries and sell repaired/refurbished components to the informal repair sector.

Over the life of the project, Solibrium aims to:

- Gather information and research on solar use and prevalence, as well as the e-waste problem in Kakamega County
- Develop virtual and physical infrastructure for solar e-waste tracking
- Develop and pilot a take-back/buy-back business model

AT A GLANCE

Project Location(s)

Kenya

Organization Type

Solar Distributor

Focus

1. Take-back and collection

2. Product repair, refurbishment, recycling

Partner(s)

Renewable Energy & Resource Efficiency Promotion in International Cooperation (REPIC) and myclimate Foundation

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SOLAR E-WASTE CHALLENGE PROJECT SPOTLIGHT

HINCKLEY RECYCLING

Creating an innovative incentive system and increasing repair capacity through provision of spare parts, creation of an open manual, and training platform.

This project aims to develop a sorting, conditioning and reassembly process for reusable battery cells from solar e-waste, to evaluate the potential for diverting cells into second-life applications. They will also evaluate incentive and logistical optimizations of their current collection systems to increase the uptake of solar e-waste from solar companies and the informal repair workers.

Nigeria has made huge investments in the off-grid solar sector and aims to electrify over one million households with solar in the next five years. However, Nigeria is considered the E-Waste Capital of Africa, with over half a million tonnes of discarded appliances processed annually. In order to ensure sustainability of the targeted investments, Nigeria must increase recycling capacity significantly. Developing second-life battery applications presents a sustainable solution for the increasing quantities of lithium-ion batteries in the country.

Through the Solar E-Waste Challenge, Hinckley Recycling—the first ever registered e-waste recycler in Nigeria—will procure equipment build capacity for solar e-waste recycling in the facility. Hinckley will also develop a process to reuse battery cells by manufacturing new products from off-grid solar batteries.

Over the life of the project, Hinckley aims to:

- Set up a complete battery testing and recycling equipment.
- Develop a detailed sorting, conditioning and reassembly process/ manual for battery cells from solar e-waste for second life applications
- Develop second life battery prototype and commence battery pack manufacturing
- Establish sales channel for the reconstituted battery packs

AT A GLANCE

Project Location(s)

Nigeria

Organization Type

Recycling Company

Focus

1. Take-back & collection

2. Enhance product recycling

Partner(s)

Lumos Global B.V
Taisen Company
Carnegie Mellon University-Africa

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SUNNYMONEY

Creating an innovative incentive system and increasing repair capacity through the provision of spare parts, technical training & creation of an open repair manual and mobile phone application.

This project aims to reduce e-waste by extending the life of solar lights. SunnyMoney's project will enhance repair opportunities through the creation of trained repair technicians and a freely available repair manual and mobile phone application that enhances access to repair information and promotes a culture of repair.

When out of warranty solar lights stop functioning in rural Zambia, there are limited or no options for repair. Frontline informal sector technicians do not have the tools or parts to repair solar products or lack product-specific information. Customers do not have the confidence and information to attempt technical repair themselves. As a result, these products contribute to the growing e-waste problem.

Through the Solar E-Waste Challenge, SunnyMoney will develop an innovative incentive scheme to encourage the take back of EoL products from SunnyMoney customers in rural Zambia. An awareness raising campaign will help to inform people about the incentives for bringing back their products and the dangers of e-waste. The lights obtained in the take back will inform the development of solar light repair guidance through a freely-available repair manual and mobile app. Local repair technicians will receive training to form a network of official SunnyMoney repair technicians and SunnyMoney will source good quality spare parts for repair, to provide real local repair options. Increasing awareness around repair possibilities by providing access to repair information will build confidence and encourage those with technical knowledge to learn more about and improve their own simple, home-based diagnosis and repair skills.

Over the life of the project, SunnyMoney aims to:

- Develop an incentivized voucher scheme
- Develop a customized app with diagnostic procedures and repair guidance for 6 key SunnyMoney products
- Set up and equip the repair centers & train technicians on solar products and repair
- Develop partnership with a recycler for safe disposal of collected items

AT A GLANCE

Project Location(s)

Zambia

Organization Type

Solar Distributor

Focus

1. Take-back and collection

2. Product repair, refurbishment, recycling

Partner(s)

University of Edinburgh

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WETU

Conducting a consumer awareness raising campaign and establishing seven collection points in Western Kenya.

The project aims to increase proper e-waste management practices by encouraging customers to dispose of products at designated collection points. WeTu will establish seven e-waste collection centres and one pre-processing plant for products collected in the region.

The Lake Victoria region of Western Kenya has seen a massive increase in solar products over the past decade. But the lack of formal e-waste management infrastructure in the area has lead to improper disposal practices by consumers and informal repair workers.

Through the Global LEAP Awards Solar E-Waste Challenge, WeTu will establish seven e-waste collection points in fishing towns surrounding Lake Victoria. Their project will include a consumer awareness campaign and incentivize consumers to return their faulty and end-of-life products in exchange for clean water vouchers. WeTu will also establish an e-waste pre-processing facility and partner with a larger recycling company to facilitate proper recycling mechanisms.

Over the life of the project, WeTu aims to:

- Sensitize and incentivize community members and stakeholders to return e-waste
- Establish their seven hubs as e-waste collection points
- Develop an e-waste pre-processing/dismantling plant at their newest hub

AT A GLANCE

Project Location(s)

Kenya

Organization Type

Solar Distributor

Focus

1. Take-back and collection
2. Product recycling

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