



THE UNIVERSITY of EDINBURGH



**Solar Waste: Disposal, Recycling and Repair  
in Africa's Photovoltaic Economy**  
A 3 Year Collaborative PhD Project between  
the University of Edinburgh and SolarAid (2014-17)

**Abstract**

While governments and donor agencies have encouraged the growth of markets for low cost solar photovoltaic technologies in Africa questions about what happens when these technologies reach the end of their working lives remain poorly understood. In collaboration with a leading international charity SolarAid, this project sets out to address the problem of solar waste in Sub-Saharan Africa, by developing two country case studies of the cultures and practices of waste and recycling around solar technology. The project will: 1) identify ways in which, and communities for whom, solar waste becomes a resource; 2) analyse economies of waste, collection, disposal and recycling; and 3) assess the role and potential for SolarAid to promote recycling. These questions will provide a comprehensive insight into the emergence and implications of waste disposal and recycling, as well as providing, SolarAid, with data around the impacts of the solar industry and strategies how to best engage with clients in this project and elsewhere in southern Africa. The project will make the results of the project available to major players in Africa's off grid solar lighting community.

**Context and Background**

While governments and donor agencies have encouraged the growth of markets for low cost solar photovoltaic (PV) technologies in Africa as part of support for transitions to a low carbon economy, questions about when these technologies reach the end of their working lives remains poorly understood. This project sets out to explore the cultures of waste and recycling around solar PV technology in Sub-Saharan Africa, through extended case studies in Kenya and Malawi. Kenya and Malawi both have established markets for solar PV technology – from solar home systems to ultra-affordable portable lanterns. The case studies will examine the conditions under which solar waste - old and broken solar panels, solar batteries, regulators, casings and wiring systems – is reworked, reused or traded, recycled or decommissioned; and they will explore the ways in which economies of waste, collection, disposal and recycling create new value, bringing new monetary rewards and livelihood opportunities. The case studies will also look at existing or parallel markets for comparable e-waste, from mobile phones for example, and sector specific interventions. In doing so the project sets out to yield new empirical data that can contribute to the development of realistic solutions to the future recycling and reuse of solar energy systems, by identifying innovative waste management systems that may circumvent the need to build expensive conventional waste collection infrastructure and can be replicated in communities around the world.

**Research Objectives**

The aim of the project is to develop two country case studies of the cultures and practices of waste and recycling around solar technology. The research objectives are threefold:

1. To identify ways in which, and communities for whom, solar waste becomes a resource
2. To analyse economies of waste, collection, disposal and recycling.
3. To assess the role and potential for SolarAid to promote recycling.

These questions will provide a comprehensive insight into the emergence and implications of waste disposal and recycling, as well as providing the third sector partner, SolarAid, with data around the impacts of the solar industry and strategies how to best engage with clients in this project and elsewhere in southern Africa, and to make the results of the project available to major players in Africa's off grid solar lighting community.

## Methodology

The project will develop a multidisciplinary, comparative case study approach that maps onto the research objectives outlined above. Each country study will involve approximately 6 months of field based research, working out of SolarAid's country offices to engage with key institutional stakeholders and to map waste economies. In each country the project will draw on an established methodological tradition in studies of material culture by setting out to follow waste objects through diverse sites, locations and arenas of value.

## Outcomes and Timetable

<b>Year 1: 2014-15</b> Preparation, training, proposal	<i>Semester 1</i> Courses taken in Core quantitative data analysis; Research skills: data collection
	<i>Semester 2</i> Courses taken in Research design; Research in Africa Energy Policy & Politics <i>or</i> Science, Tech. and Development
	- Initial meeting with partners and supervisors (University of Edinburgh and Partners) - language lessons (Edinburgh Global) - One-month secondment to SolarAid - Completion of Extended Proposal and Transition Board
<b>Year 2: 2015-16</b> Fieldwork	- Field based research begins - Field reports for SolarAid - 1 workshop/conference presentation in country/or in UK
<b>Year 3: 2016-17</b> Writing up and knowledge exchange	<i>Semester 1</i> - Chapter drafting (based in Edinburgh) (fortnightly supervision) - Secondment to SolarAid (London) - Feedback Workshop
	<i>Semester 2</i> - Thesis drafting (based in Edinburgh) (fortnightly supervision) - Return visit for final fieldwork - Production of Case study report and Policy briefing documents - Completion of thesis (Edinburgh)

## Knowledge Exchange, Dissemination and Impact

The student will work closely with SolarAid, and where possible with input from other key players in the solar PV sector, to develop appropriate mechanisms (field reports, briefing paper, market analyses) for making research findings available to wider publics and to ensure that the research outcomes feed directly into the work of SolarAid and the solar PV sector as a whole. This research will generate considerable knowledge for SolarAid, beyond that which it is currently able to generate internally, that will help to establish pro-poor energy markets, which have been identified by organisations such as the UN, World Bank and DfID as crucial to sustainable development in the world's poorest countries. The results of this project will engage and be made available to all major players in Africa's off grid solar PV sector, including LightingAfrica, the Global Off-Grid Lighting Association, the Silicon Valley Toxics Coalition and members of the off grid social networking site LuminaNet.

## **Supervisory Arrangements**

This studentship will be supervised by Dr Jamie Cross (Lecturer in Anthropology and Development, University of Edinburgh), with input from Kat Harrison (Director of Research & Impact) at SolarAid.

## **Advisory group**

It is planned that the project will form an advisory group of relevant people who would input into the project, help shape the design and process, help inform the research, review and advise on initial recommendations/solutions, and then assist in disseminating and putting into practice the results.

## **More information and contacts**

If you have questions, would like to be involved or kept informed on the progress of this project please get in touch with Dr Jamie Cross on [jamie.cross@ed.ac.uk](mailto:jamie.cross@ed.ac.uk) and/or Kat Harrison on [kat.harrison@solar-aid.org](mailto:kat.harrison@solar-aid.org).