Shining a light on short-lived solar: the lives, lifespans and afterlives of off-grid solar in Madagascar

Abstract

Off-grid solar (OGS) products are increasingly prevalent throughout Sub-Saharan Africa, with significant growth in product distribution since 2010, and continued growth expected in the coming decade (Lighting Global, 2020; Lighting Global/ESMAP et al., 2022b). OGS products, such as solar lamps and solar home systems, tend to have short lifespans of a few years, prompting questions such as 'What can be done to extend product lives?' and 'What happens to broken products in contexts where policies or infrastructure for hazardous and non-hazardous waste management are limited?'. To seek to answer such questions, I am interviewing OGS users, distributors, and repair technicians in rural and urban areas in southern Madagascar, and making observations of usage behaviour, repair techniques and disposal practices. Initial results indicate that villagers are embracing unbranded solar technology, cobbling together basic solar home systems to provide limited electricity. Issues are frequently encountered, with components such as batteries requiring replacement every one to two years. User behaviour is likely to have a significant effect on product lifespans. Where possible, users tend to attempt their own repairs, before reaching out to self-taught repair technicians who use rudimentary tools. While old batteries are collected and exported for recycling, other unrepairable products sit in people's homes in the hope that one day they will be fixed or otherwise considered valuable. The research findings may have implications for policymakers, product designers, and development practitioners working to promote renewable energy solutions and achieve the United Nation's Sustainable Development Goal 7: affordable and clean energy.