

Policy brief: Solar e-waste in Sub-Saharan Africa

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Introduction

The societal benefits of off-grid solar solutions are undeniable: 120.3 million people now have improved energy access, 18.6 million sources of traditional lighting have been phased out and USD 192 of annual savings achieved, on average, per household. Off-grid solar is a healthier, safer and cheaper alternative to kerosene, batteries and candles. It also has the potential to lead to job creation both within the off-grid solar value chain, and for people using solar home systems in small businesses. At the same time, access to energy enables broader societal benefits including improved education and healthcare.

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End-of-life Challenges

According to the Global Off-Grid Lighting Association, 4.11 million solar products were sold globally between January and June 2019. These products are transforming livelihoods in rural areas through more working hours, income generation and job creation. It is critical that policymakers look at the sustainability of the off-grid solar sector including managing electronic waste (e-waste) for products that have reached end-of-life. The main source of e-waste is the lithium battery which has a

defined lifespan of two to six years. Management of lithium-based batteries is challenging even at the global level as only limited capacity is currently available considering the majority of volumes are expected to come back in the future, connected with the development of electric mobility.

Between 2009 and 2019, approximately 40 million quality-verified products were sold across the world, of these 20 million were sold before 2016. The batteries in the products sold before 2016, have either reached their end-of-life, or are near there. It is therefore timely for policymakers to start addressing e-waste at policy level. Countries like India, Germany, United Kingdom and the USA have developed policies and regulations for solar e-waste. In some of these countries, several challenges have been encountered.

Challenges Encountered in Developing E-waste Policies and Regulations



Insufficient data on e-waste stocks, flows and routes. Data supports the development of a policy tailored to the needs of each country. International trade statistics used as the basis for the Global E-waste Monitor can represent a very first source of data.



Limited awareness on the e-waste hazard at various levels – policymakers, government officials and consumers. This can be addressed through awareness campaigns.



An informal sector engaged in collection and recycling that is seen as a bottleneck but can be integrated with the formal sector.



Insufficient stakeholder engagement leading to weak and inefficient policies or longer policy development durations.



Limited capacity for physical collection and treatment infrastructure. Global Environmental Facility (GEF)-funded projects have been helpful in addressing this challenge, in some countries.



Enforcement and ensuring that each stakeholder fulfills their duties and obligations.

E-waste Policy and Regulatory Landscape in Sub-Sahara Africa

Between 2013 and 2019, African countries like Ghana, Kenya, and Rwanda developed policies, legislation and strategies to manage e-waste as shown in Table 1. However, only Ghana has a regulation that partially covers off-grid solar products .

Table 1: National e-waste legislation in selected countries

COUNTRY	COMMENTS
Ghana	Eco Levy- Hazardous & Electronic Waste Control and Management Regulations 2016 (L12250) Electronic Waste Control and Management Regulations 2016 (Act 917- In Force) Environmental Protection Agency Act 1994 (Act 490)
Kenya	E-waste Rules (Draft – January 2019) National E-Waste Management Strategy Environmental and Coordination Act (Amended), 2015
Rwanda	(In force, April 2018) National E-Waste Management Policy
Uganda	(In force, March 2016) Guidelines for E-Waste Management in Uganda
Tanzania	No specific policy or regulation related to e-waste management, but the National Information and Communication Technology Policy (2016) recognises the challenge of e-waste and the need for environmental laws and regulations to address it.
Ethiopia	No specific policy. The UN University (UNU), the UN Industrial Development Organization (UNIDO) and the US Environmental Protection Agency (EPA), in partnership with the Ethiopian Environmental Protection Authority and Ministry of Communication and Information Technology to implement an Ethiopian E-waste Management Project.
Somalia	No specific regulation for waste management.
Sierra Leone	The scope of the National Policy Roadmap for Integrated Waste Management includes e-waste along with four other waste streams (Draft).
Nigeria	National Environmental (Electrical/Electronic Sector) Regulations S.I. No 23 of 2011 to address the E-waste problem.
Senegal	No specific regulation on e-waste.
Malawi	No specific regulation on e-waste. The National Waste Management Strategy recognises e-waste as a significant, emerging waste stream in Malawi.
Zambia	No specific regulation on e-waste.
Zimbabwe	No specific regulation on e-waste. ZOL (Zimbabwe's leading Internet service provider) has partnered with EnviroServe (a UAE based recycling firm) and Econet to make the environment better through the responsible disposal of e-scrap by providing recycling services for electronic devices in this programme endorsed by the Environmental Management Agency.
Mozambique	No specific regulation on e-waste.

E-waste Policy and Regulatory Landscape in Sub-Sahara Africa

Most of the policies in sub-Sahara Africa were informed by legislations developed in countries, **mainly Europe**, where: challenges of informal collection and recycling are less relevant, basic infrastructure for waste management is present, consumers and industry are

generally aware of waste management practices, and off-grid solar products are hardly present. To develop regulation that is tailored to the solar e-waste realities in Africa, there are four options that policymakers should consider:



These options present different financial and operational obligations to consumers, producers or taxpayers. In developed and developing countries, financial models based on Extended Producer Responsibility (EPR) are

most common. EPR encourages the design and production of electrical and electronic equipment which take into full account and facilitate repair, possible upgrading, re-use, disassembly and recycling.

Alternative Approaches

Some of the recently adopted bills in Africa show different ways of implementing the EPR concept: Ghana enacted the eco-levy for all electrical and electronic equipment exported into the country, including solar products, in November 2018. Currently, an external service provider collects the eco-levy before products are released from customs control. The rates are \$ 1.5 for solar lanterns and a minimum of \$ 8 for solar home system kits, depending on the components and appliances included in the kit. The collected fees are handled by the E-waste Fund (an ad-hoc organization that was created specifically for that purpose) and are

disbursed with pre-defined purposes, including the set-up and management of a dedicated treatment facility. In the Kenya Draft Bill Environmental Management and Coordination (Electrical and Electronic Waste Management) Regulations, 2019 producers are expected to report on the number of products placed in the market annually and projections for the following year to enable calculation of their market share and corresponding financial obligations. They are also required to have contacts with licensed recycling facilities and proof they met their obligations in respect of financing the handling of the problematic fractions

Generally, the approaches for E-waste Regulation are:

Voluntary take back and recycling: the industry does collection and recycling on a voluntary basis. Many of the off-grid solar companies operating in sub-Sahara Africa have their own systems for take back and recycling, to ensure sustainability of their business models.

Mandatory take back and recycling: where industry players are required by legal obligation to take back and/or recycle end-of-life products.

In developing and enforcing solar e-waste regulations, governments should consider:



The effect of the regulation on affordability and access to solar products especially for the poor and vulnerable population segments



Infrastructure for e-waste collection, recycling and handling hazardous waste. Does the infrastructure exist? Is it sufficient?



The cost of collection especially in rural areas



Allowing producers to set-up their collective take-back schemes for cost effective compliance



Fair enforcement across all companies so that there are no free riders.

Table 2 provides a summary of regulatory and non-regulatory frameworks for e-waste management in different countries across the world.

Table 2: Example of various regulatory and non-regulatory frameworks globally

COUNTRY	REGULATORY AND NON-REGULATORY FRAMEWORK	REMARKS
Germany – Mature market with EU-directed, PV-specific waste regulations	The Electrical and Electronic Equipment Act was revised in 2015 to reflect the amendment in the EU directive on WEEE to include solar PV panels.	
UK – Young market with EU-directed, PV-specific waste regulations	The UK WEEE legislation (transposing EU WEEE into national law) has specific rules to define PV producer and the EPR principle. The creation of a separate PV category will give the PV sector more control over financing PV panels collection and recycling.	Before the WEEE Directive, PV industry set up an own take back scheme (PV Cycle) that was establishing take back systems in each EU country, responsible for operations
Japan – Advanced market without PV-specific waste regulations	The end-of-life PV panels are treated under the general framework of the Waste Management and Public Cleansing Act. The act defines wastes, industrial waste generator and handler responsibilities, industrial waste management including landfill disposal, etc.	In addition, the Construction Waste Recycling Law prescribes how to manage construction and decommissioning waste.
USA – Established, growing market without PV-specific waste regulations	PV panels disposed in line with the Resource Conservation and Recovery Act, which is the legal framework for managing hazardous and non-hazardous solid waste. As the act does not include specific requirements for PV panels, they have to be treated under its general regulatory framework for waste management.	California is in the forefront of developing a regulation for the management of end-of-life PV panels within its borders, by moving PV panels from hazardous waste to universal waste. Washington became the first state to pass the Solar Stewardship Bill (ESSB 5939) requiring manufacturers selling solar products into the state to have end-of-life recycling programmes for their products.
China – Leading market without PV-specific waste regulations	Waste Electrical and Electronic Product Recycling Management Regulation came into effect in January 2011. At present, however, PV panels are not included in the WEE products processing directory of the regulation.	The National High-tech R&D Programme PV Recycling and Safety Disposal Research provides policy and technology signposts for the future.

NB: This brief is mainly extracted from:

Africa Clean Energy Programme Technical Assistance Facility (ACE-TAF) and Sofies Group (2019) E-Waste Policy Handbook. Nairobi, Kenya: ACE-TAF. Available:

<https://www.ace-taf.stratech.co.ke/kb/e-waste-policy-handbook/>



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