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Promoting Productive Use of Electricity in Displacement settings

Experiences and lessons learnt from
PUE Awareness Promotion in Kalobeyei, Kenya

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Introduction

This working paper presents the experiences and lessons learnt from promoting Productive Use of Electricity (PUE) in a displacement setting of Kalobeyei, in Turkana West Sub-County, Kenya.

GIZ, through the Energy Solutions for Displacement Settings (ESDS) project, seeks to address the lack of a sustainable energy supply in Kalobeyei integrated settlement (KIS) and Kalobeyei Town, Kenya, which hosts 3,500 host community members and 47,700 refugees respectively¹.

Increased energy access through the mini-grid systems presents the opportunity for the host community and refugee residents, businesses, and institutions in Kalobeyei to expand their electricity usage to livelihood and income generation activities; so-called 'Productive Use of Electricity' (PUE). In addition, the uptake of PUE appliances can contribute to the

financial sustainability of mini-grids due to increased power consumption. To this end, the ESDS project designed and implemented a campaign aimed at 'sensitizing households, businesses and social institutions on available opportunities and potential for income generation through PUE in Kalobeyei integrated settlement (KIS) and Kalobeyei town in Kenya'².

The promotion of PUE awareness was carried out by SNV on behalf of the ESDS project from July 2022 to December 2022. This report presents the state of PUE in Kalobeyei, the design and campaign activities and, lastly, identifies the recommendations for replication in displacement settings.

1 UNHCR Kenya Country Statistics. As of October 2022.

2 Kalobeyei integrated settlement and Kalobeyei town will be referred to as Kalobeyei unless explicitly mentioned.

The state of PUE in Kalobeyei³

The Kalobeyei population, of which 64% is below 18 years old, comprises people from a wide mix of cultures, speaking a variety of languages, and who enjoy various levels of electricity access and income. According to UNHCR, approximately 76.68% of the

refugees hosted in Kalobeyei settlement originated from South Sudan as of January 2023. Other nationalities include DRC Congo, Ethiopia and Burundi, Somalia, Uganda, Eritrea, and Rwanda.

Electricity and lighting energy sources

The households, businesses, and institutions in Kalobeyei have various levels and sources of energy access. Mini-grid developer Renewvia Energy Kenya Limited operates a 20kWp hybrid solar mini-grid system in Kalobeyei town, and a 541kWp hybrid mini-grid system in Kalobeyei integrated settlement Village 1 connecting 2,409 households, 323 business and 40 institutional customers. A 2021 energy status baseline survey conducted by the IFC revealed that of the Kalobeyei settlement population without access to electricity supply from mini grids, 23% relied on

solar lanterns whereas 17% used dry-cell torches. 11% used their mobile phones while 4% relied on firewood/twigs or wood fuel, 3% had solar home systems among other sources of lighting. Similarly, findings within the host town revealed reliance on solar lanterns by 24% of the population whereas 12% used torches, 10% used their mobile phones, 7% used firewood or wood fuel, and 7% had solar home systems, among other sources of primary lighting.⁴ Most of these energy sources are available through the local markets.

Income and access to finance

Income levels differ, but for the majority cash assistance provided by humanitarian agencies is an important source of income.⁵ Other sources include monthly (incentive) salaries, business earnings, remittances and/or grants. Residents earned on average a monthly income of KES 8,400 (approx. €67) in Kalobeyei town and KES 7,700 (approx. €59) in Kalobeyei Settlement.⁶ However, a more recent socio-economic impact survey conducted by the ESDS project in October 2022 at both locations revealed that monthly revenue by businesses ranged between KES 10,000 to KES 15,000, and further most of these were individually owned enterprises.

There are several financial services available to the refugee and host communities, but informally organised saving groups are the primary providers of credit services due to restrictions limiting their access to formal credit services.⁷ The most widely applied payment methods for energy services in Kalobeyei are 'cash-and-carry' and 'Pay as You Go' (PAYG) while the 'fee-for-service' model is upcoming. Asset financing or utility-led financing had not been deployed as far known as at the time of conducting the promotion of PUE awareness campaigns.

³ Information presented is based on a situational analysis which drew from literature, PUE supply and demand surveys and key informant interviews.

⁴ IFC, March 2022, Energy sector baseline study in the Kakuma-Kalobeyei refugee hosting area in Kenya: https://www.ifc.org/wps/wcm/connect/dcdb8d4-49a5-42a2-9307-c292a27e102f/KKCF+Energy+Study+Report_final.pdf?MOD=AJPERES&CVID=o08sYPO

⁵ For an overview of Cash-based assistance see: <https://help.unhcr.org/kenya/kakuma/cash-based-interventions-cbi/>.

⁶ IFC (March 2022). Energy Sector Baseline Study in the Kakuma-Kalobeyei Refugee-Hosting Area in Kenya.

⁷ Freshon, GIZ, 2021. End-User Finance Study And Payment Systems Research In Displacement Settings.

PUE Stakeholders

Stakeholders that were identified in the appliances supply and demand value chain in Kalobeyei, who need to be strategically engaged in the implementation of awareness and training activities include PUE

appliance suppliers, financial intermediaries, government agencies, end users (representatives), humanitarian agencies, local NGOs, and communication service providers.

Availability and use of PUE appliances

PUE appliances are those powered by electric sources including plug-and-play SHS, component-based solar systems, mini-grids and the national grid that can help a business to generate additional income, mechanise an activity currently done manually or replace fuel (diesel/petrol).⁸ This assignment focused on the productive uses of electricity in Kalobeyei either powered by stand-alone solar systems (SASS) (plug-and-play (P&P) kits and component-based systems) or solar mini-grid systems.

In terms of supply, there is a wide range of PUE appliances available in the area. This includes appliances used for food preparation (refrigeration), tailoring, phone-charging, cold storage, barber or hair salon services, provision of entertainment services, IT services, water pumping, construction among others

(see Annex 1 for an overview). Only a limited number of PUE appliances are available in Kalobeyei as most are sold by retailers in Kakuma town and Kakuma refugee sub-camps.

In terms of demand, the research found that households and businesses are interested in offering a broad range of business services if enabled to acquire the appropriate PUE appliances required to do so. Businesses in Kalobeyei enjoy higher levels of access to high tier electricity supply as compared to households but the main activities powered are similar and basic, namely lighting and phone charging.⁹ Institutions have one or more sources of electricity and use a range of appliances based on the services they provide.

Uptake barriers

Several barriers prevent households, businesses, and institutions in Kalobeyei from purchasing and/or (consistently) using PUE appliances. These include a lack of knowledge on the wide variety of available (quality) PUE appliances – their benefits and opportunities, high upfront payment cost, limited access to formal loan services, lack of (reliable) electricity access, high (perception of) cost of electricity, limited skills locally on operation, maintenance, and basic repair, and lack of access to support (such as after sales) services.

The design and implementation of PUE promotion campaign aimed to address above barriers as far as possible by showcasing a wide array of available PUE appliances through different channels, suppliers' sensitization on PUE and different type of payment models, training to saving groups on how to offer lending services for PUE appliances to their members, and, lastly, a focus on the operation & maintenance and after sales service rights and best practices.

8 EnDev (2021). The market for productive uses of solar energy in Kenya: a status report. Online.

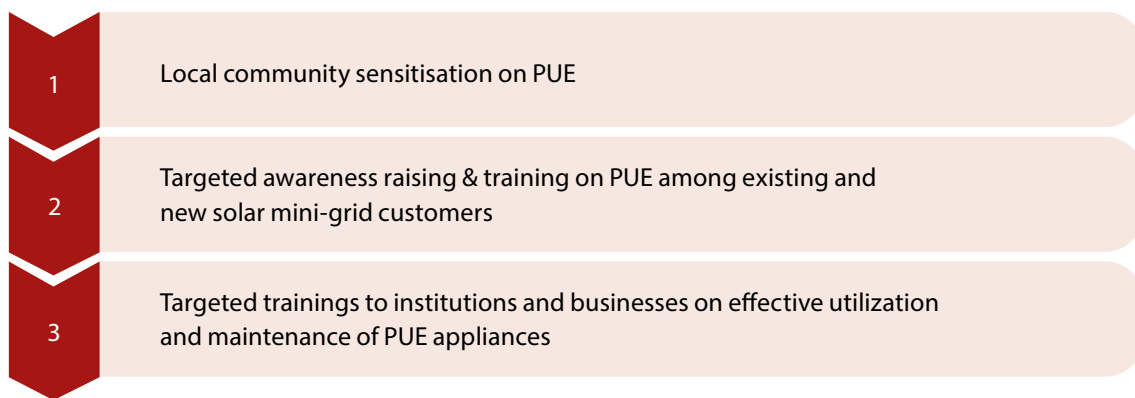
9 High tier electricity supply refers to Tier 3 upwards of the [Multi-tier framework](#) for measuring energy access.

Promotion of PUE in Kalobeyei

Campaign design

A situational analysis was initially carried out to inform the design of the campaign. The analysis involved literature review coupled with supply surveys to enrich the outcome. Based on the analysis findings, a three-phased campaign implementation plan was

developed. The plan entailed a high-level general awareness to reach a broad audience to more targeted training activities to (aspiring) entrepreneurs, to current PUE owners on effective utilization and maintenance, as indicated in the diagram below.



In each campaign phase, the selection of the target groups, messages, channels, activities, training content and PUE appliances were tailored to the different objectives informed by the insights of the situational analysis as presented in Table 1 below.

Table 1: Summary of PUE promotion activities carried out in Kalobeyei (July to December 2022)

Project implementation phase	(Primary) target group	Focus PUE appliances
<p>1. Local community sensitisation: on the opportunities and benefits of using electricity for income generating purposes, PUE appliances available in the market and where to buy them.</p> <p>Activities: Supplier training, Public Service Announcements (PSA), flyering, poster and radio talk shows.</p>	Households and businesses with (expected) electricity access to the Renewvia mini-grids	Mini-grid compatible food preparation appliances (electric cookers, blenders, and toasters), sewing machines, and hair dressing equipment (including hair dryers and shavers).
	Households and businesses without (expected) access to the existing mini-grids	PUE appliances with stand-alone solar systems including solar-powered fridges, freezers, water pumps, shaving kits, computer, and entertainment services (TVs, radios, and speakers).
	PUE appliance suppliers in Kalobeyei and Kakuma town and sub-camps ¹⁰	Mini-grid and stand-alone solar systems compatible PUE appliances
<p>2. Targeted awareness raising & training for existing and new mini-grid customers: on use of electricity for (additional) income generating purposes.</p> <p>Activities: Market demonstrations, radio mentions and PSA, trainings for entrepreneurs and village savings and lending groups (VSLAs)</p>	Households and businesses connected to Renewvia mini-grids with basic electricity usage (lighting & charging)	Mini-grid compatible food preparation appliances, fridges, and entertainment systems
	Households and businesses connected to Renewvia mini-grids with advanced electricity usage (entertainment, cooling, cooking, productive uses)	Mini-grid compatible hairdressing equipment, sewing machines, cooling (fridges and freezers)
	Saving groups	Mini-grid compatible appliances
<p>3. Targeted training for institutions and businesses: on effective utilization, operation & maintenance of PUE appliances</p> <p>Activities: Trainings</p>	Institutions: teaching staff of vocational training institutes.	Food preparation: EPCs, microwave/ovens, blenders/juicers, air fryers, toasters/sandwich maker, water dispensers and fridges/freezers.
	Businesses: (aspiring) tailors and food and beverage services	Service category: Electric sewing machines and iron box

* The above activities were carried out in collaboration with organizations who use PUE appliances and/ or support the communities with livelihoods activities. Among these were Danish Refugee Council, Peace Winds Japan, SwissContact, and Humanity and Inclusion.¹¹

- During the local community sensitisation phase, awareness was raised through training of PUE vendors, public service announcements, radio talk shows with PUE vendors in which listeners called in to ask questions, appliance demonstrations in market areas, and dissemination and display of posters and flyers.
- In phase two, targeted trainings were facilitated to (aspiring) entrepreneurs and saving groups on the investment opportunities on PUE and safe electricity usage.

- The third and last phase focused on training on effective utilization and operation and maintenance of PUE appliances. The training targeted TVET teachers and business owners whose operations use PUE appliances.

The campaign employed an onward evaluation at the end of each phase and learnings integrated to improve the implementation of activities in subsequent phases. Activities were carried out in partnership with local private sector partners such as PUE appliance suppliers and mini-grid operator; and humanitarian agencies – especially those focused on refugee livelihoods. This helped to enhance the desired outputs and stakeholder interest in the key campaign messages. The main slogan used throughout the campaign was: “Earn Income with Power – Tumia Umeme Ongeza Mapato”. See Annex 2 for examples of promotional materials used during the campaign.

10 The situational analysis only found 4 vendors of PUE appliances in Kalobeyei, hence the campaign also targeted suppliers in Kakuma town and sub-camps to ensure generated demand can be met.

11 Elaborate activity reports and training materials are available on request.

Key findings and lessons learnt

This section presents findings and lessons learnt during the PUE promotion campaign in Kalobeyei. Given the limited period for which the campaign was executed (6-months), this working paper does not exhaustively cover best practises required to inform the planning and programmatic design of long-term strategies to enhance productive use of energy (particularly electricity) in displacement settings. For example, while unlocking of suppliers and end-user financing remains a critical factor in accelerating PUE, it would require longer term interventions to enable market growth.

The following are some of the notable findings and learnings:



The use of various channels and local languages is critical to reach and inform a wider audience, especially given the multi-national and ethnic context of a displacement settings such as Kalobeyei.



There is need for further awareness on available energy sources. Most respondents or participants during the awareness campaigns revealed a lack of prior awareness on the expansion of Renewvia solar mini-grid in Kalobeyei settlement. As well, participants lacked knowledge on where to buy PUE appliances, the cost of the appliances and availability of technicians for repairs and after sales services.



End user training on proper wiring and safe use of electrical appliances is important. This helps to reduce on cases of electrical faults that may cause damage to appliances, property, or life-threatening accidents.



PUE appliance vendors are willing to supply specific products on demand. It was revealed that suppliers avoid stocking of 'non-moving' goods which results in a limitation of product variety within Kalobeyei. However, suppliers pointed out a willingness to import specific products on request.



Inclusion of VSLAs training as part of PUE promotion is critical. Refugees face a major obstacle in gaining access to commercial loans due to lack of Kenyan national ID and collateral. Immediate and potential access to finance is therefore made possible through community organized village savings and lending groups which create an avenue for pulling of resources towards purchase of bigger appliances. Such appliances can be used to support community group projects. An example of a group activity can be a milling machine or a solar water pumping system for irrigation in Kalobeyei. However, saving groups lack knowledge on how to design appropriate loan products for PUE products, hence need support in building their technical capacity.



Unlock other financing services to support growth in PUE. Alternative financing mechanisms, beside VSLAs, to provide a wider range of lending products was also identified as a major enabler that should be addressed to increase PUE in displacement contexts. This include linking the end users and or suppliers to organizations like Africa Entrepreneurship Collection (which offer loans and entrepreneurship trainings) and banks such as Equity and KCB.



Opportunity to increase PUE uptake through vendor knowledge on O&M. All participants appreciated the trainings provided, but especially PUE suppliers who pointed out they sometimes missed out on sales because they were not able to explain the operation of an appliance or offer after sales services. There is opportunity to increase PUE uptake when suppliers understand and are able to provide O&M services for appliances sold (such as water pumps, hairdressing, ICT).

Recommendations

Conduct in-depth research prior to the design and implementation of PUE promotion activities to tailor them to the needs of the market segment and supply. The research should include:

- The socio-economic profile of target audiences such as nationalities, sources of income, access to finance, and their energy situation (energy sources, energy demand, and level of connectivity among target groups).
- A stakeholder analysis relevant to the promotion campaign. These can include suppliers, financial intermediaries, government agencies, end users, humanitarian agencies and local NGOs implementing energy access and livelihoods projects, and communication service providers. Identify direct and indirect implementing partners.
- A PUE market analysis outlining supply of the available appliances in the local market(s), their current use and demand, and main drivers and barriers to uptake.
- Mini-grid system capacity (constraints) and potential overloading concerns.
- Main communication channels, tools and messages that speak to a broad range of audiences, considering diversity in language and literacy skills.

Design and implement PUE promotion activities with a clear set of objectives, priority target group(s) and appliances, implementation partners, activities to be accomplished, and tools required using an iterative, 'phased' approach. Consider to:

Carefully identify, segment, and involve all relevant stakeholders along the value chain:

- Go beyond generating 'new' demand among potential end users and include PUE value chain actors and existing users to ensure sustainability beyond the project.

- Private sector involvement (energy service providers and appliance distributors) in the design and implementation is key to ensure generated demand meets actual supply.
- Leverage on strategic partnerships, to include existing entrepreneurship development and communication initiatives, local distributors, and financial service providers to ensure synergies.



Choose focus PUE appliances based on:

- Electricity source(s) available to selected target group(s)
- Direct income generation potential (as opposed to complementary services such as fans and radio)
- Market availability and provision of proper after sales service

Implement trainings on effective utilization, operation and maintenance of electrical appliance(s), and safe and appropriate use of electricity in close consultation with mini-grid operators, appliance vendors and technicians.

- The trainings enable PUE: i) users to use appliances in a safe and effective way while avoiding mini-grid system overloads, ii) vendors to advise (potential) customers on proper operation and maintenance and improve after sales services.
- For large equipment and/or appliances whose operation can be complex due to multiple components, it is recommended that a dedicated training on O&M be done for each appliance. This gives end users ample time to understand the functionality and the unique maintenance requirements of the system components.

Annex 1. Overview of available PUE products in Kalobeyei, Kakuma area

Appliance type	PUE application	Mini-grid application	With stand-alone solar
Light bulbs	Longer opening times		
Mobile phone charging station	Charge for a fee		
Fridge/freezer	Sell cold beverages/fresh produce		
Audio system	Complementary service/entertainment (in eatery, barber, cybercafé, bar)		
Radio	Complementary service (in eatery, barber, cybercafé)		
TV	Show movies/football matches for a fee + complementary service		
Fans	Complementary service (in eatery, barber, cybercafé)		
Computer/laptop	Use IT services for a fee		
Printer	Print for a fee		
Photocopier	Copy services for a fee		
Hair clipper	Hair dressing services		
Hair dryer	Hair dressing services		
Sewing machine	Tailor services		
Blender	Food preparation (eateries/catering)		
Electric pressure cooker	Food preparation (eateries/catering)		
Water dispenser	Sell water/Eateries/Catering		
Public address system	Rent for use/marketing tool		
Water pump	Irrigation for farming		
Electric kettle	Food preparation (eateries/catering)		
KEY <ul style="list-style-type: none"> • Available  • Expected Supply  • None/Unknown 			

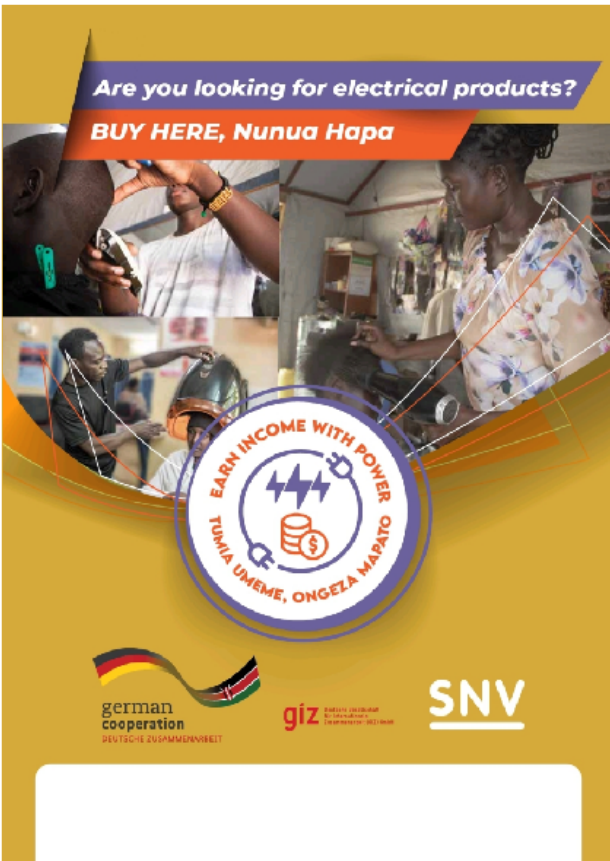
Annex 2. – Examples of campaign poster



Poster/Flyer general awareness campaign – Mini-grid compatible PUE appliances



Poster/Flyer general awareness campaign – Stand-alone Solar System PUE appliances



'Buy Here' poster for PUE suppliers



Instructions for safe electricity use



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