



The role of clean energy in
enhancing livelihoods and economic
resilience in refugee communities

About SNV

SNV is a global development partner, deeply rooted in the countries where we operate. We are driven by a vision of a better world: A world where across every society all people live with dignity and have equitable opportunities to thrive sustainably. To make this vision a reality, we need transformations in vital agri-food, energy, and water systems.

SNV contributes by strengthening capacities and catalysing partnerships in these sectors. We help strengthen institutions and effective governance, reduce gender inequalities and barriers to social inclusion, and enable adaptation and mitigation to the climate and biodiversity crises.

Building on 60 years of experience we support our partners with our technical and process expertise and methodological rigour. We do this in more than 20 countries in Africa and Asia with a team of approximately 1,600 colleagues. By being adaptable and tailoring our approaches to these different contexts, we can contribute to impact at scale, resulting in more equitable lives for all.

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About the humanitarian market-based energy access project

The EnDev refugee component being implemented by SNV in Kenya from June 2023 to June 2025 is a continuation and a scaling up of the Humanitarian Market Based Energy Access (MBEA II) project completed with support from EnDev in the previous phase. The project is facilitating market development for the energy sector with a focus on the Kakuma refugee camp, the Kalobeyei settlement camp, and the host communities. The focus on refugee settings will contribute to poverty alleviation through EnDev's agenda to leave no one behind.

The overall aim of the project is to support market development to accelerate access to appropriate, reliable, and affordable energy services for households, and micro, small- and medium-sized enterprises (MSMEs) by strengthening supply and enhancing uptake of quality off-grid solar-powered systems and clean cooking solutions, resulting in improved livelihoods, increased productivity, employment creation, and increased incomes, therefore contribution towards the nation's economic development.

Through a market-based approach, the project is anchored on the private sector specifically the stoves and solar supply side actors (including manufacturers, producers, and their local distribution teams and partners such as stockists, sales agents, technicians, and resellers/ last mile entrepreneurs (LMEs), to facilitate market development for energy access technologies targeting households and businesses. As well as facilitating awareness creation and access to user credit/finance to support full acceptance of the energy technologies and enhance their purchase and use in the refugee market.

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Introduction

Access to clean energy in displaced settings is more than a basic necessity it is a transformative enabler that improves the well-being of refugees and host communities while driving sustainable development. Guided by SNV's global energy ambition to create inclusive markets for sustainable energy and promote equitable livelihoods, the Humanitarian Market-Based Energy Access (MBEA) III Project, funded by EnDev, is championing this mission in Kenya.

This project delivers clean, safe, and affordable cooking and lighting solutions to households in Kakuma Refugee Camp, the Kalobeyi Integrated Settlement, and the surrounding host communities. By strengthening the supply, distribution, and adoption of clean cooking technologies and solar-powered solutions for households and Micro, Small, and Medium Enterprises (MSMEs), the project aligns with SNV's focus on enhancing energy access, mitigating climate change, and promoting social inclusion.

In line with the 2018 Global Compact on Refugees and EnDev's commitment to "leave no one behind," the MBEA III Project contributes directly to SNV's goals of increasing access to renewable energy, improving energy efficiency, and fostering resilient livelihoods for all especially for underserved populations in sub-Saharan Africa.

This integrated approach not only addresses immediate energy needs but also supports sustainable development and climate resilience in vulnerable communities.

A market-based approach to energy access

The project leverages a market-based approach to address barriers in the distribution and adoption of clean energy technologies. By focusing on both supply and demand, the project has provided technical assistance and capacity development to over 6 private sector actors, including manufacturers, producers, and local distributors of clean cooking stoves, productive use of energy (PUE) appliances, and solar solutions. This enhances the availability of high-quality, community-tailored energy products. On the demand side, the project collaborates with financial institutions to improve end-user access to credit, addressing affordability barriers and enabling households and businesses to adopt modern energy solutions. Additionally, outreach activities raise awareness and stimulate demand, creating a sustainable ecosystem that bridges the gap between supply and demand for clean energy technologies.

Solar deep freezers have become indispensable for shop owners, particularly in Turkana West, where high temperatures drive demand for cold beverages.



Photo credits: SNV.



By the end of October 2024, the project had directly improved access to clean cooking for 18,587 people and access to electricity for 8,083 people, demonstrating significant progress toward enhancing energy inclusion. Additionally, 157 productive use of energy (PUE) products were sold, contributing to increased income-generation opportunities for households and businesses. The project also stimulated job creation, with 42 new jobs established within the clean cooking stove value chain and 87 new jobs created in the electrification value chain, highlighting its contribution to local economic growth and livelihood improvement.

Productive use of energy for economic growth and social inclusion

To address these challenges, the MBEA project took a phased approach to establish a local SPU. The first phase in 2018 focused on constructing a temporary facility, procuring basic stove production equipment, and training artisans from both the refugee and host communities. 15 artisans (13 male and 2 females) were trained on Jiko Kisasa stove production by Keyo Pottery Enterprises. Within the same phase, theFor businesses in Kakuma, access to reliable energy has been a catalyst for economic growth and social inclusion.

Solar-powered solutions have unlocked opportunities for businesses to reduce costs, improve operational efficiency, and expand their services. One notable example is Sunshine Hotel in Kakuma town, which illustrates the economic benefits of solar energy adoption. The hotel faced unstable supply of electricity, which disrupted its operations and limited their service. By investing in a solar home system from Sunking, a private sector partner under the MBEA project, the hotel now enjoys reliable lighting and phone charging services. This stable power supply enables the hotel to extend its operating hours and attract a larger customer base.

The hotel's strategy involved engaging women and youth as stove promoters to sell "naked liners" (unclad stove linings), but this approach was not yielding the intended result because many areas had already received free stoves from UNHCR.

“We chose solar lighting because it’s more affordable and sustainable compared to grid electricity,” the hotel manager explained.

Similarly, solar deep freezers have become indispensable for shop owners, particularly in Turkana West, where high temperatures drive demand for cold beverages. These freezers distributed by Access and Move a private partner of the MBEA project, has enabled businesses to preserve drinks and perishable goods, meeting market demand in markets that are completely off grid with no access to electricity. However, the high initial cost of solar deep freezers is a significant barrier to adoption, particularly for small businesses in Kakuma and Kalobeyei. The adoption situation is also exacerbated by the fact that refugee owned small business cannot raise the required eligibility documents by convectional financial institutions. To address this challenge, the project has partnered with financial institutions, such as Kenya Bankers Sacco, to offer financing solutions to end-users. These partnerships allow shop owners to pay for solar freezers in instalments, making the technology more affordable and helping businesses take advantage of the long-term savings and benefits it offers.

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Even with these financial options, some shop owners still struggle to afford solar deep freezers. To tackle this, a unique practice of collaboration has emerged within the local business community. For instance, Abdallah, a shop owner, lends deep freezer space to neighbouring businesses to store beverages like soft drinks and water. This arrangement, based more on community support than profit, showcases the strong sense of goodwill and collaboration in Kakuma's business environment, where shop owners work together to overcome challenges.

Similarly, fish sellers, many of whom are women, have formed a chama (informal savings group) to collectively purchase a solar deep freezer. Fish, easily sourced from nearby Lake Turkana, is a popular delicacy in the area especially for communities from great lakes, but while smoking drying and salting are common preservation methods, many customers prefer fresh fish, making solar deep freezers necessary for preservation. However, despite the financing options, financial literacy remains a gap. A case in point is the group "Fish Rosa," led by Furaha, which came together to purchase a deep freezer through a loan from Kenya Bankers Sacco.

While the deep freezer has enabled the group to preserve fish and meet demand for fresh fish, Furaha initially struggled to understand the repayment terms. Relying on a friend to explain the cost implications, she was misinformed about the initial cost, and when it came time to sign the contract, Furaha didn't carefully review the terms. Two months into repayment, she was surprised to learn she owed an additional KES 30,000, leaving her feeling misled and disappointed.

"This is really frustrating and unacceptable," she complained.



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"I let my neighbour store their drinks in my freezer because we all face the same challenges. It's not about making money but supporting each other," Abdallah explained.

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Enhancing energy access for households

At the household level, access to lighting and e-cooking can significantly transform daily living conditions. These technologies foster healthier environments and reduce reliance on traditional biomass fuels, enhancing overall quality of life. Additionally, solar home systems (SHS) equipped with solar lighting and entertainment like radios and televisions have profoundly improved livelihoods for many households in Kakuma Refugee Camp. One such example is Nelly Mukacha, a resident of Kakuma 2 refugee camp, who now owns an SHS with both solar lighting and a television.



“I used to have a solar lantern before, which only provided lighting,” Nelly explained. “But my kids often had to visit my neighbours to watch TV, and sometimes they weren’t welcomed. So, I decided to upgrade to a SunKing SHS with a TV. Now, my children can enjoy entertainment at home, and I can also stay informed by watching the news.”



Further for businesswomen like Grace who owns a small electronics shop in Kakuma town, she has experienced a complete transformation in her cooking routine since purchasing an electric pressure cooker (EPC) from Nyalore Impact.



“We chose solar lighting because it’s more affordable and sustainable compared to grid electricity,” the hotel manager explained.



Grace decided to invest in the pressure cooker for its efficiency and convenience, particularly for her busy evenings. Beyond saving time, she has observed several other benefits. The EPC is simple to operate and clean and compared to the cost of buying charcoal, it is more economical since it consumes minimal electricity. With the EPC, Grace can prepare meals like beans, lentils, and githeri, making her life significantly easier. She also appreciates how the food retains its natural aroma.

Another case is Mary, a resident of the Kalobeyei Integrated Settlement, who also experienced a transformation in her cooking routine with the EPC. However, her appliance was stolen, leaving her frustrated.

“I was really upset because I had gotten used to the EPC, which was much cheaper and more efficient than the traditional charcoal stove,” she explained. Determined to continue using the appliance, Mary bought a new EPC through her work as a marketer for the product. She has since taken extra precautions to secure her kitchen, ensuring the new pot is locked away or brought to the main sitting area to prevent theft. “I’m really careful with my new pot now, and I’ve made sure my kitchen is more secure,” she shared, emphasizing the importance of the appliance in making meal preparation more efficient and affordable.



Despite these positive experiences, some households have faced challenges with maintenance, of the EPCs. One user reported that after a year of use, the EPC was no longer operational due to damage to the inner pot, the black coating peeling off, and issues with the lid. These problems were linked to common practices, such as vigorous scrubbing, which are often used for aluminium cooking pots in Kenya. Although the supplier has promised to resolve the issue, this situation highlights the ongoing need for continuous sensitization, and training on the proper operation and maintenance of these appliances to ensure their longevity and effectiveness.

Lessons learned

1. Solar solutions for PUE drive economic

growth: Reliable solar energy plays a crucial role in business growth, particularly in areas with unstable electricity. It enables businesses to operate more efficiently, extend their operating hours, and attract more customers, driving economic development.

2. Community collaboration and investment models overcome financial barriers:

High initial costs for solar appliances can be a significant barrier, but community collaboration helps mitigate this. Group investment models, such as informal savings groups or chamas, along with Pay-As-You-Go (PAYG) schemes and partnerships with financial institutions, make solar solutions more affordable. These models enable businesses and households to access solar technologies without the heavy initial costs, fostering broader adoption.

3. Financial literacy and affordability are key to adoption:

Ensuring users understand the available financing options, including PAYG and loan products, as well as the long-term savings of solar solutions, is critical for successful adoption. Financial education makes solar technologies more affordable and empowers users to make informed decisions on the best options for their needs.

5. Ongoing maintenance support is necessary for

product longevity: Proper maintenance training and continuous sensitization is essential to ensure solar appliances remain functional over time. Without adequate care, appliances can become damaged, reducing their affordability and long-term effectiveness. Continuous support and training ensure the sustainability and affordability of solar technologies.

Recommendations

1. Enhancing financial linkages and literacy: Need to continue strengthening financial linkages with institutions like Kenya Bankers Sacco and also improving access to affordable solar financing. Tailored loan products and flexible repayment plans will support adoption, while financial literacy training will help consumers make informed choices and maximize long-term benefits.

2. Expand access to maintenance support and training:

To maximize the longevity and efficiency of solar-powered appliances and clean cooking, it's crucial to provide ongoing training for users on proper maintenance and care. Additionally, creating accessible repair services within local communities would support the continued use of these technologies.

3. Promote awareness of the long-term benefits of solar

solutions: More efforts should be made to raise awareness about the long-term cost savings and operational efficiency offered by solar-powered and clean cooking technologies. This would help overcome initial cost barriers and encourage more businesses and households to adopt these solutions as well as improve their livelihoods.

Conclusion

The MBEA III Project has demonstrated the powerful role of clean energy solutions in enhancing the lives of refugees and host communities in Kakuma Refugee Camp and the Kalobeyei Integrated Settlement. By providing access to affordable, reliable energy, the project has enabled businesses to thrive and households to improve their living conditions. Through a market-based approach, the project has overcome many barriers to energy access, including cost, availability, and financing, while promoting sustainable solutions for both economic growth and social inclusion.

However, challenges such as high initial costs, financial literacy and the need for ongoing maintenance highlight areas for improvement. To ensure greater success and sustainability, it is essential to continue strengthening financial linkages, improve financial literacy, and provide ongoing support for appliance maintenance. By building on the lessons learned and integrating these recommendations, the project can further empower communities, ensuring more widespread adoption of clean energy solutions and contributing to long-term, inclusive development in these regions.



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