



UNHCR
The UN Refugee Agency



Access to Clean Energy in Displacement Settings

Case Study: Kenya

Background

Provision of clean and affordable energy is a key catalyst for sustainable development in all countries. Access to energy enhances access to education and economic opportunities, increases safety and improves the provision of health services; all are components of UNHCR's mandate to protect refugees, asylum seekers, stateless people and others forced to flee.

UNHCR acknowledges the significant challenges that refugees face globally in accessing even basic energy services in displacement settings. Lack of access to affordable, reliable, and sustainable energy solutions further exacerbate the already difficult circumstances that refugees face. However, in line with its mandate UNHCR is constantly exploring the potential for innovative interventions by the humanitarian sector, working together with affected communities, host governments, UN country teams, and various partners from different sectors, to transform the lives of refugees and those forced to flee.

The UNHCR [Global Strategy for Sustainable Energy 2019-2025](#) aims to enable refugees and host communities to meet their energy needs in a safe and sustainable manner, while also addressing protection, health and environmental concerns. UNHCR has adopted the World Health Organization (WHO) definition of clean fuels and technologies based on the impact on refugees' health. Fuel and technologies are considered clean only if they achieve WHO targets for particle matter (PM) and carbon monoxide (CO) emissions. In addition, UNHCR defines the use of biomass in combination with improved technologies

as a transitional solution while moving towards more sustainable and cleaner practices.

The UNHCR energy strategy is part of the strategic outcomes set in the [Operational Strategy for Climate Resilience and Environmental Sustainability 2022-2025](#) to respond to the growing global climate emergency. Guided by the [Strategic Framework for Climate Action](#) (SFCA), UNHCR focuses on mitigating the impact of climate change and environmental degradation on refugees and their host communities, supporting sustainability by preserving and rehabilitating the natural setting and minimizing the environmental footprint of humanitarian assistance.

This report presents case studies of clean and transitional energy interventions in refugee communities, implemented by UNHCR, government and partners in Kenya. Energy-related approaches from these case studies can be adapted and replicated in other refugee-hosting countries, as a mean of meeting the basic needs of displaced people, improving their well-being and, when feasible, creating sustainable livelihood opportunities through the provision of energy. The following case studies are based on experiences in refugee settings and can be adapted to situations of internal displacement as well.

The mini-grid in Kalobeyei settlement, run by Renewvia Energy, provides electricity to 250 households.

© UNHCR/Sebastian Rich



Sajjad Malik, Director, Division of Resilience and Solutions, UNHCR and Maja Lazić, Deputy Head, World Bank-UNHCR Joint Data Center on Forced Displacement speak to Jackline at the Kalobeyei minigrid.

"Before the mini-grid, we didn't have access to electricity. Our homes were dark. I am proud to work with a project that's connecting our homes and businesses to electricity and improving our quality of life", says Jackline.

© UNHCR/Charity Nzomo



Country Profile Kenya

Country context

The Republic of Kenya is an East African country of 580,367 km², with access to the Indian Ocean. Its topography ranges from low-lying coastal regions to a mountainous plateau (CountryReports, 2022). Kenya population accounts for nearly 55 million in 2021, with a yearly growth rate of 2.2% (World Bank, 2022). Nearly 70% live in rural areas. Kenya is an ethnically diverse country, with ethnic groups of the Kikuyu (22%), Luhya (14%), Luo (13%), Kalenjin (12%), Kamba (11%), Kisii (6%) and Meru (6%), among others. While each ethnic group speaks its own language, the national language is Swahili, which alongside English is spoken by nearly all Kenyans.

Kenya's Gross Domestic Product (GDP) reached USD110 billion in 2021, with a yearly growth rate of 7.5% in the same year (World Bank, 2022). It is the largest economy in East Africa as per 2022 (Kenya National Treasury, 2022).

Refugee situation

Kenya currently hosts around 561,836 displaced persons, of which 89% are refugees and 11% asylum seekers (UNHCR, 2022a). More than half (53%) of refugees and asylum seekers originate from Somalia (287,931 persons), followed by 25% from South Sudan (148,377 persons). Other countries where forcibly displaced come from include Burundi, DRC, Ethiopia and Sudan. Given the current political situation in the region, Kenya will likely remain a prominent refugee-hosting country on the continent (UNHCR, 2022b). Most refugees live in formal camps, namely Dadaab (43%) and Kakuma (42%), followed by those who settled in urban areas (16%). Refugees are not allowed to work outside of the camps, which limits their independence and self-reliance. There are also growing tensions with the host communities in Dadaab and Kakuma,

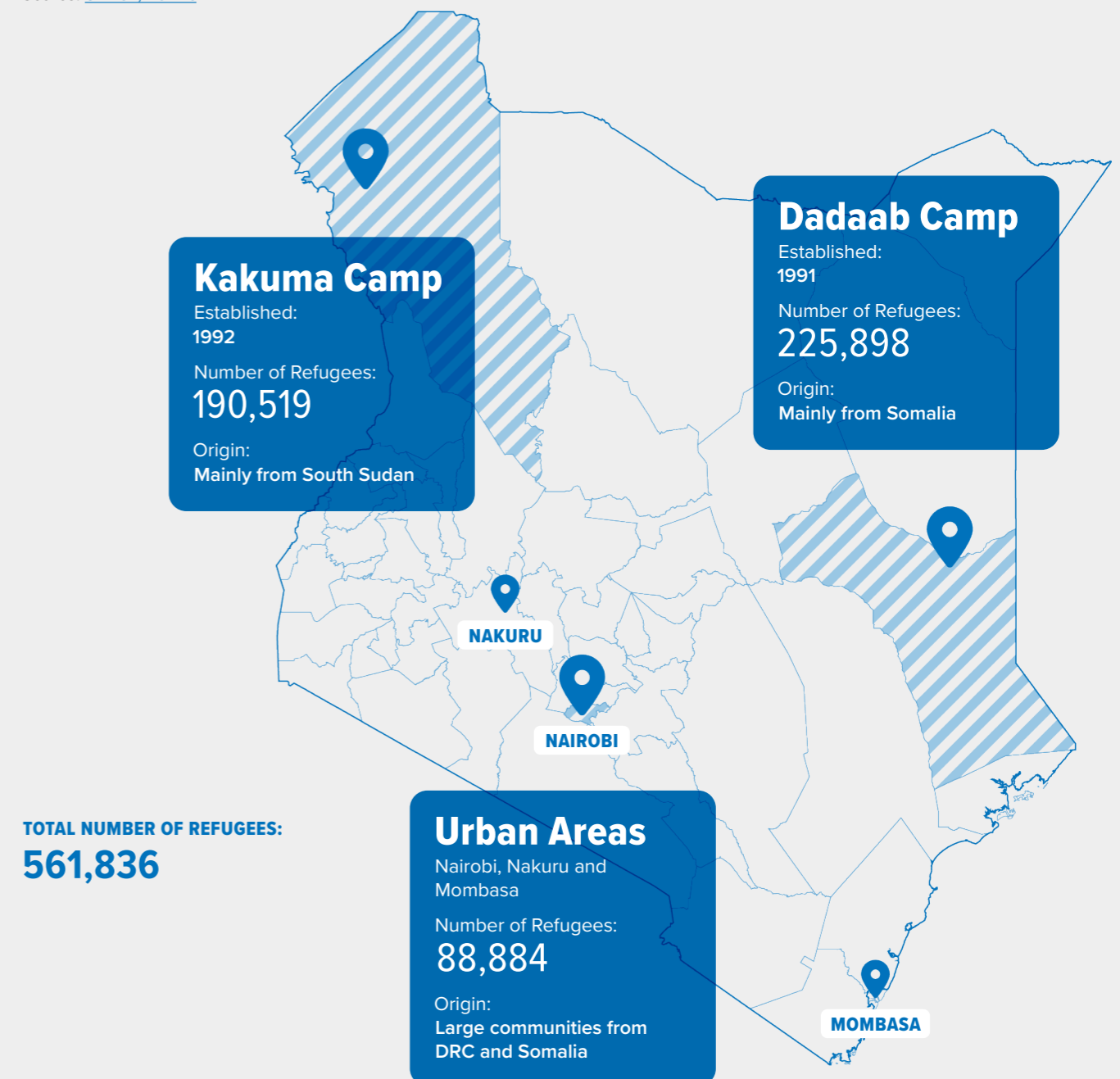
Kenya



that threaten the peaceful coexistence with refugees (GIZ, 2022). In the past, programmes supporting the economic prospects of locals by allowing local farmers to supply refugee camps with food, have proven successful for both groups (FAO, 2017), as have programmes where refugees and host communities live closely together and use the same infrastructure (ECRE, 2020).

Refugee settlements in Kenya

Source: UNHCR, 2022c



Country Policy Framework

Refugee situation policies

- Under Kenya's previous [2006 Refugee Act](#), refugees were unable to obtain work permits and were required to live in camps.
- Adopted in 2022, [Kenya's new Refugee Act](#) enhances the rights of refugees and asylum seekers and includes significant changes concerning refugee economic inclusion, integration, refugee status determination and employment rights. The Act commits to improve refugees' freedom of movement and gives them the right to work and earn a living when their qualifications have been recognized. It also provides better access to documentation and education, and gives refugees the right to start a business. The 2022 Refugee Act is a move away from previous closed camp models to one that allows refugees more rights and self-reliance. Kenya's policy evolution comes at a critical time in the region, with an expanding [East African Community \(EAC\)](#) which could become a gamechanger for refugees. For example, refugees from EAC countries can claim the rights of citizens (including freedom of movement and the right to work) in any of the seven EAC states.

National policies relevant to energy access and climate resilience

- Kenya ratified the United Nations Framework Convention on Climate Change (1992) in [1994](#), ratified the Kyoto protocol in [2005](#) and signed and ratified the [Paris Agreement](#) in [2016](#).
- Kenya has a regulated electricity market. Following the unbundling of the energy sector in 2006, the role of the private sector in power generation, distribution and supply has grown through the rising number of independent power producers (IPPs). The transmission network, however, remains a public monopoly.
- Kenya's most recent [Energy Act](#) was passed into law in 2019 and regulates all energy activities in Kenya. The act introduced the Energy and Petroleum Regulatory Authority (EPRA), which succeeds the former Energy Regulatory Commission (ERC). EPRA oversees imports and exports of electricity, and all activities related to petroleum and coal (World Bank, 2021). The Energy Act also includes provisions related to feed-in tariffs for renewable energy (policy designed to support the development of renewable energy sources by providing a guaranteed, above-market price for producers); promoting the generation of electricity from renewable energy sources by allowing power producers to sell electricity - generated at a pre-determined tariff - to the national grid. The government aims to raise the current electricity access rate of 65% of rural households to 100% and to incentivize rural grid connections via lower connection

fees (IFC, 2022).

- In 2020, the Ministry of Energy introduced the [National Energy Efficiency and Conservation Strategy](#) - a roadmap and action plan towards achieving energy efficiency goals for Kenya's economy while reducing the demand for fossil fuels and related greenhouse gas emissions. It also enhances the potential of renewable energy sources to meet a larger portion of the country's energy needs and its contribution to achieving the [Paris Agreement](#) and [Sustainable Development Goal 7](#).
- The government aims to transition towards clean cooking energy ([UN, 2021](#)) and has supported this with VAT exemptions for a range of clean cooking fuels, including biogas, sustainable fuel briquettes and ethanol ([Clean Cooking Association of Kenya, 2021](#)). An overview of energy related laws, policies and regulations can be found [here](#).

Energy situation

Country energy situation

Electricity access in Kenya has increased tremendously over the past 20 years, reaching almost 75% of the population in 2022. While access to the national power grid is 65% for rural areas, all urban areas are fully connected. Kenya's installed electricity capacity reached 2,990 MW in 2022, growing significantly since 2014 when 1,800 MW were installed ([International Trade Administration, 2022](#)). Most electricity is produced by renewable sources, with large shares of geothermal (42%), hydro-power (34%), and wind (14%). Thermal sources deliver 8% of electricity generation ([Kenya Power, 2021](#)). Kenya is the eighth largest geothermal producer worldwide and possesses the largest geothermal power plant in the world (Olkaria IV plant with 280 MW capacity). Wind and solar energy are also key growth areas with high potential for expansion. More than 90% of the rural population and about 75% of all Kenyan households still use firewood and charcoal as the primary fuel for cooking ([New Climate Institute, 2021](#)). Cleaner options include LPG, biogas, and ethanol. However, even among households that adopted clean cooking sources, many continue to use charcoal, kerosene, and other polluting fuels ([Kenya Ministry of Energy, 2019](#)).

Refugee energy situation

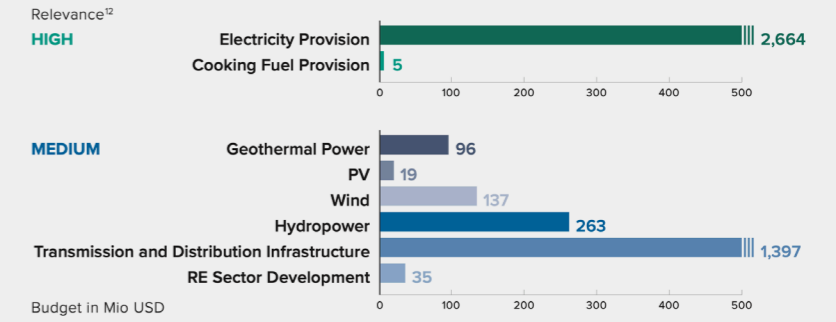
Due to their remote location, refugee camps are usually disconnected from the national electricity grid. For instance, in the Kakuma refugee settlement, only 1% of an estimated 200,000 refugees in the center

and the adjacent Kalobeyi settlement access electricity through the national grid. As a result, most refugees lack access to clean, reliable, and affordable electricity. Therefore, improving access to clean and sustainable energy sources is essential for UNHCR (UNHCR, 2022). Furthermore, Garissa and Turkana counties, where the refugee camps are located, are earmarked as regions underserved by the national grid. The government considers these off-grid regions in its policies, e.g., the [National Electrification Strategy](#) (2018). Even though about 75% of Kenyan households have access to electricity, counties like Turkana - where Kakuma and Kalobeyi refugee camps are located - only have electricity access rates of 15%. The local government intends to raise this to 30%. Refugees face several barriers in trying to connect to the national grid. A national ID is needed for individual customers, and informal businesses find it challenging to get all the registration and tax documents in order. Firewood remains the primary source of cooking fuel for 92% of households in Kakuma camp and Kalobeyi settlement, and 98% in Dadaab. Daily firewood consumption per person is about 1.3kg in Kakuma and 1kg in Dadaab camp. Apart from firewood, households in refugee settlements also use charcoal and kerosene to meet their cooking needs. In Kakuma, the charcoal market is run mainly by the host community, representing their primary source of livelihood. Households in Kakuma and Kalobeyi camp spend, on average, KES 1600 (USD 15) per month on energy solutions, which equals 17% of their income (Energypedia, 2022; [IFC, 2022](#)).

Development actors and funding of energy programmes

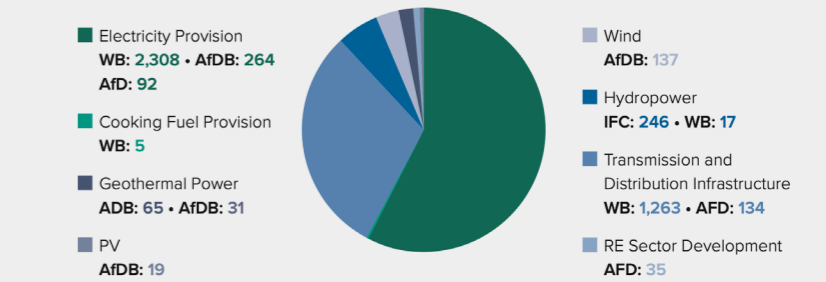
A [mapping of development actors](#) in the country shows that the World Bank (WB), the African Development Bank (AfDB), the French Development Agency (AFD), and the International Finance Corporation (IFC) are active in Kenya's energy programming involving significant energy programme budgets. The budgets are directed into activities ranging from large-scale energy sector market and infrastructure improvement activities, to on-the-ground electricity access in remote locations and improved cooking solution activities. Large-scale infrastructure activities in the country will support the energy situation in refugee settings long-term and provide a general framework to improve the energy situation. Electrification activities for households and improved cooking solutions have an immediate beneficial impact on the refugee population. The following graphs show energy activities ranked according to their relevance for refugee contexts. Figure 1 shows that the programme activities with a high relevance thematic to refugee contexts in Kenya include mainly the provision of electricity with a budget of USD

FIGURE 1
ACTIVE AND PLANNED PROGRAMMES OF MEDIUM AND HIGH RELEVANCE BY TOPIC



Low relevance programmes activities like Enhance Private Sector Engagement, Transnational Electricity Trade Development, Fossil Fuel Infrastructure Development, Administrative and Policy Improvements, Energy Sector Development sum up to Mio USD 506.

FIGURE 2
ACTIVE AND PLANNED PROGRAMMES OF MEDIUM AND HIGH RELEVANCE BY TOPIC AND ACTOR



Budget in Mio USD

FIGURE 3
ACTIVE AND PLANNED INVESTMENT OF MEDIUM AND HIGH RELEVANCE BY ACTOR: 4.611 MIO USD

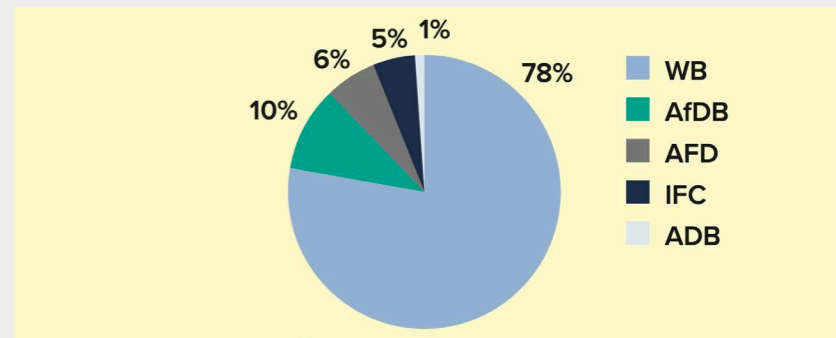
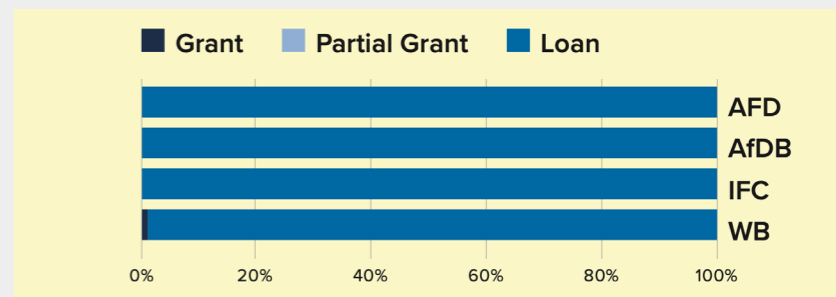


FIGURE 4
FINANCING TYPE BY ACTOR FOR ACTIVE AND PLANNED PROGRAMMES OF MEDIUM AND HIGH RELEVANCE



2.6 billion. Also, cooking fuel provision is highly relevant for refugee contexts, and active and planned programmes cover a budget of USD 5 million. Figure 1 also breaks down the specific budget distribution of the total budget of USD 1.94 billion among programme activities concerning transmission and distribution infrastructure, hydropower, wind, geothermal power, sector development for renewable energies, and photovoltaic systems. Figure 2 highlights the funding institutions active in the respective thematic programmes. The primary funding actor is the WB, with a share of 78%. The budgets for high- and medium-relevance activities are detailed by the funding agency and financing mechanisms in Figures 3 and 4.

Overview: UNHCR energy programming in Kenya

UNHCR has been actively shaping humanitarian energy interventions in Kenya for over a decade. This is reflected in the [SAFE strategy](#), implemented between 2015-2018, and [UNHCR Global Strategy for Sustainable Energy](#), have become more diverse and targeted, building on an increasingly deep understanding of the sector. In recent years, interventions have progressively shifted from in-kind assistance to market-based approaches. UNHCR has worked in close cooperation with local partners and aligned activities with national plans and priorities over the last recent years.

Cooking fuel: Most refugee households in Kenya use firewood and charcoal for cooking. In previous years, UNHCR and its implementing partners had regularly distributed firewood to all families in the camps. This approach could not meet the entire demand of the population. In 2013, a targeted strategy in the Dadaab camp was to provide firewood to vulnerable households only. In Kakuma camp in-kind firewood distribution ended in 2020, followed by cash-based interventions for cooking needs. Institutions like schools and health centres continue to receive firewood covering 100% of their needs. UNHCR has also piloted the provision of alternative cooking fuels to households, including wood briquettes, macadamia nut shells, LPG and ethanol. Over the period 2014 - 2017 around 400 families received LPG cookers and gas. Between 2015 and 2018 around 2,000 households received ethanol cookers and fuel.

Cooking technology: For over a decade, UNHCR has provided refugee populations in Kenya with energy-efficient stoves to reduce firewood consumption whilst supporting households in meeting their energy needs. In cooperation with implementing NGOs, improved cookstoves (Maendeleo stoves) are produced by refugees in Dadaab camp and

distributed among the population and host community. These activities reach large parts of the population, with 79% of households in Dadaab owning at least one improved cook stove in 2019. Still, universal coverage is hampered by growing refugee populations and constrained funding. Further activities include training on stove production including awareness campaigns on efficient cooking practices.

Lighting: Throughout the past ten years, UNHCR and its partners have supplied solar lanterns to refugee households and installed and maintained solar streetlights (SSLs) in refugee camps. Multi-purpose solar lanterns that charge mobile phones are among the preferred options. Since 2017, these efforts have been enormously extended in the Kakuma camp and Kalobeyei settlement with the support of the IKEA Foundation, with [59,160 solar lanterns distributed and 1,260 SSLs](#) installed. The interventions include training on the use and handling of the equipment. As part of the [Energy Solutions for Displacement Settings \(ESDS\)](#) programme, a solar mini-grid in Kalobeyei has provided additional electricity for lighting and other services since 2019.

Electricity: In 2021, UNHCR and its partners began to solarize 53 institutions in the Kenyan camps, namely 37 schools, seven hospitals, five field offices, two vocational training institutions, one government facility and one police station. For each institution, solar panels and lithium-ion batteries for storage were installed, offering a total of 1.12 MW of installed solar capacity. The system provides electricity for all institutional needs and light for the community by powering high-lighting masts. In addition, the mini-grid in the Kalobeyei settlement also provides institutions with renewable energy.

Ethanol for Cooking Access

Between 2015 and 2018 in Dadaab camp, UNHCR and its local partners supplied a total of 2,282 households with ethanol cookstoves and fuel, as well as training on their use. The intervention followed a 2015 pilot study with 100 households. The ethanol was produced from biomass (molasses) allowing for faster, safer and cleaner cooking. While demand was high, supply-side constraints resulted in the temporary end of the project in 2018. Since then, UNHCR has investigated a more market-based approach to facilitate the private sector engagement in the humanitarian setting to expand the supply of ethanol for cooking.

Overview

Between 2015 and 2018, UNHCR and the ethanol company SAFI International, Kenyan environmental NGOs Fafi Integrated Development Organization (FaiDA) and the Relief Reconstruction and Development Organization (RRDO), initiated the distribution of ethanol cookstoves and fuel to households in Dadaab. A 2015 pilot targeting 100 homes confirmed the viability of ethanol as a clean cooking option in the camps, including the procurement, transport, and handling of stoves and fuel. Subsequently the programme was extended to 1,000 families (approx. 2% of the camp population). In 2018, another 1,182 persons with specific needs received stoves and fuel. Unfortunately, after the 2018, the intervention was discontinued following a shortage of ethanol caused by several large Kenyan producers going out of business. Also, the lengthy process for securing tax exemptions on ethanol from the Ministry of Energy led to bottlenecks in the timely delivery of ethanol to Dadaab. Since then, efforts have focused on attracting the private sector.

Nyamouch Both, 22 year old refugee from South Sudan, is the mother of two children. Like many other refugees in Dadaab, she often had to go to the bushes to collect firewood for cooking. In isolated areas they are at risk of violence. Firewood scarcity has also been associated with environment degradation of the areas surrounding the refugee camps.

Nyamouch and 200 other refugee families benefited from a new pilot project of alternative energy and were given Liquefied Petroleum Gas (LPG) cylinders or ethanol stoves. "I am very happy about receiving a gas cylinder. I won't need to go to bushes any more to collect firewood. This is going to help me and my family in our daily cooking". Nyamouch told UNHCR.

© UNHCR/Assadullah Nasrullah



Ethanol details

Ethanol is an alcohol-based fuel which can be distilled from a wide variety of biomass feedstock. It is a renewable cooking energy alternative, which is highly convenient to use because it burns with a slow, steady flame without emitting harmful smoke. On the other hand, the use of ethanol requires the establishment of a production and supply chain, which heavily influences fuel prices. When biomass is derived from waste residues, e.g., sugar production, ethanol presents an exceptionally reasonable opportunity as its production does not rely on newly planted crops that would otherwise compete with the land use of agricultural output for food or livestock (WFP, [2022](#)).

Delivery model

The ethanol fuel and cookstoves were distributed to refugee populations free of charge. The ethanol was distributed on an on-off basis, covering the households' demand for some months of the year. Stoves and fuel were produced and delivered by a private company. Upon receiving the stoves, household members were trained to use the equipment. The

plan in providing the stoves was to build long-term ethanol demand in local markets in the hope of creating commercial livelihood opportunities. Following the pilot project, UNHCR explored a number of market-based approaches, including Cash-Based Interventions for cooking and encouraging private companies to enter the markets in Dadaab to supply both refugee and host communities. While demand in the camps remains high, the collapse of the Kenyan ethanol-producing industry and the reluctance of the private sector to become active in humanitarian settings limits the supply of ethanol for cooking.

Protection and health

Ethanol-based cooking is less polluting and much safer than using traditional fuels such as firewood and charcoal. The World Health Organization (WHO, [n.d.](#)) considers ethanol a clean fuel for both heating and cooking. When cooking with ethanol, users do not inhale toxic fumes that can cause respiratory disease and irritate the eyes. The risk of burns injuries, which are common when cooking with open fires, is also reduced when using an ethanol burning cookstove. That said, ethanol is a flammable fuel and must still be handled carefully to avoid fire hazards.



© UNHCR/Assadullah Nasrullah

CONSIDERATIONS ON COOKING WITH ETHANOL

Reliable production and distribution networks must be in place to ensure access to ethanol fuel for cooking. Fixed contracts should guarantee supply.

Policy alignment and financial support are essential for the uptake of ethanol cooking. For example, VAT exemptions and carbon credits can lower the prices of stoves and fuel.

Additional clean cooking interventions are needed to complement ethanol production capacities, e.g. electrification and more sustainable firewood sourcing options.

Private actors play a major role in ethanol cooking technologies and the efficiency of supply but may need market incentives to engage in humanitarian settings.

Innovations such as refillable containers can help reduce customer costs and offer positive environmental impacts (KfW, [2020](#)).

HOW TO REPLICATE THIS PRACTICE

STEP 1

Review the country's ethanol regulatory and institutional framework and understand if biomass usage restrictions, transport of hazardous liquids or national safety standards exist.

STEP 2

Assess the ethanol market in the country to understand the industry structure and to help forecast the available product quantity and supply chain.

STEP 3

Map current refugees cooking habits and needs. Consider vulnerable groups and cultural practices. For example, some groups do not use ethanol - which is a form of alcohol - for religious reasons.

STEP 4

Coordinate with country operations, local authorities, and country technical services to ensure the set-up of reliable supply chains. Conduct training on the usage of ethanol.

STEP 5

Go beyond free distribution and drive demand for ethanol through financial support, e.g., Cash-Based Interventions and investment grants.

Acceptability

Ethanol heats faster, has a higher caloric value, and is more energy-efficient than wood charcoal (Engineering for Change, [2021](#)). Saving time and money using more energy efficient fuels can widen the acceptance of clean fuels and cooking techniques. This can be further strengthened by awareness raising campaigns and hands-on trials showcasing potential savings and benefits (GIZ, [2022](#)). This contributes to the acceptance of the technology and can ease tensions between the host population and refugee communities. Although ethanol offers a clean and efficient fuel source for households, it remains challenging to set up a reliable supply chain for ethanol and to encourage rural households - which rely upon cheap or freely gathered fuelwood for cooking - to switch to ethanol.

Affordability

As part of the ethanol promotion scheme in Dadaab, stoves and fuel were distributed for free. Ethanol can be produced at low costs and - when these lower costs are passed on to the consumer - can be priced competitively compared to charcoal or kerosene. In 2019, retail prices for a litre of ethanol in Kenya were KES 85 (USD 0.83) (Kenya Ministry of Energy, [2019](#)). In subsequent years, the 16% value-added tax (VAT) on ethanol was removed, lowering its price to around KES 70 (USD 0.70). For Kenyan producers, the production cost of a litre of ethanol is estimated at USD 0.14 (Kabeyi & Olanrewaju, [2022](#)).

Self-reliance

Learning about improved cooking techniques and more efficient fuels can raise users' self-esteem and free up time for other activities. Involving the local population in producing and selling clean fuels supports their livelihood opportunities. For example, local fishermen can benefit from the output of an ethanol company in Kenya. They can earn additional income by leasing boats and selling their labour to collect biomass (water hyacinth) from the lakes. They can also regain access to fishing grounds that were impaired by the growth of an invasive species like hyacinth in the past (Engineering for Change, [2021](#)).

Environment

Ethanol replaces the need for charcoal or firewood for cooking, thereby reducing deforestation (WFP, [2022](#)). Emissions of greenhouse gases and polluting smoke are low, and ethanol production has a minimal environmental impact when sourced from biomass waste. By harvesting invasive species (such as water hyacinth) and using them for ethanol production, the local ecosystem can be strengthened (Engineering for Change, [2021](#)).

Lessons learnt from other UNHCR practices

[Community-owned ethanol business cooperatives](#)

UNHCR has supplied refugee camps in Ethiopia with ethanol stoves and fuel for over a decade. Following a change from the initial in-kind support to cash-based interventions, the organization has shifted towards a more market-driven model. Three cooperatives, with refugees and host community members, were established and equipped with an initial stock of ethanol to supply the camp population. However, due to the low purchasing power of the population, it relied on a strong dependency on humanitarian aid. Also, it was difficult for cooperatives to take on large-scale loans to secure their operation. Over time, the distribution of ethanol ground to a halt due to the high costs of producing ethanol and a supply shortage.

[Community-owned ethanol business cooperatives](#)

A pilot project in Sudan's White Nile State supplied around 800 refugee families and 200 households from host communities with ethanol for cooking. The ethanol was produced locally by a large sugar company using by-product residues. The pilot was in response to refugees' request for cleaner cooking options. The project increased the safety of women, freed up time formerly used for collecting firewood and cooking, and reduced the harm caused by smoke from cooking with firewood. Furthermore, it improved waste management and encouraged reforestation. However, after the pilot phase, the programme was discontinued because it failed to move from in-kind humanitarian aid to a market-based approach due to the limited purchasing power of refugees.

📍 Ethiopia



📍 Sudan



Cash-Based Interventions for Cooking Energy

In 2021, UNHCR implemented Cash-Based Interventions (CBIs) to support energy needs in refugee settlements in Kenya. The intervention targeted 41,000 families (nearly 200,000 individuals) with unrestricted CBIs, offering refugees the freedom to spend the money how they wished. In addition, it further strengthened the local economy and the self-sufficiency of refugees, as the money was spent on goods and services in the local markets. A follow up survey confirmed the general acceptance of CBIs but found that the cash alone cannot fully cover the cost of their energy needs.

Overview

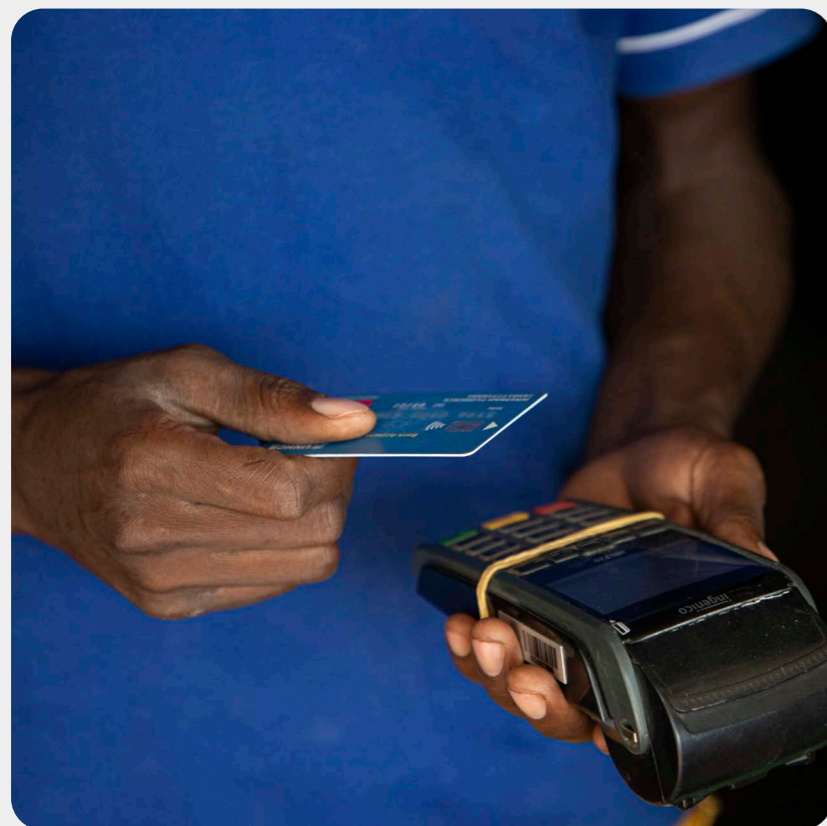
Cash-Based Interventions (CBIs) are a core component of UNHCR's humanitarian response. CBIs provide refugees cash or vouchers and the freedom to purchase goods and services in the local market ([UNHCR, 2022](#)). CBIs usually cover a certain amount for each essential needs, in this case, a predefined sum for energy purchases per person. This helps boost the local economy and foster better relations with the host community. In 2021, UNHCR replaced the in-kind provision of firewood in the Kakuma camp and the Kalobeyei Settlement with CBIs for energy needs - as part of the support for basic needs and shelter - reaching more than 41,000 households ([UNHCR, n.d.](#)). The CBIs budgeted 42 KES (0.41 USD) for energy per person, which equals around 10 kg of firewood or 4 kg of charcoal. This means that beneficiaries can access roughly double the amount of cooking fuels as compared to the previous in-kind assistance in the camps. The CBI allows the average refugee household in Kakuma and Kalobeyei to meet around 11% of their cooking needs. Of the total CBI received, households spent 30% on hygiene items, 27% on energy and 19% on food.

CBI technical details

A popular form of CBI is [multipurpose cash grants \(MPGs\), transferred](#) to households to cover basic needs. The transfers can be paid out in one payment or in regular instalments, ideally to an individual's bank account. MPGs are unrestricted cash transfers, meaning that the funds can be spent at the discretion of the household and not bound to a particular item or goods. This puts the needs and preferences of the individual at the heart of the intervention. In 2021, 95% of UNHCR's CBIs were unrestricted, with most spending the cash on food, rent, health, energy, and other basic needs (UNHCR, n.d.). In a monitoring survey, 90% of respondents preferred cash or a combination of cash and in-kind assistance, over just in-kind assistance (UNHCR, [n.d.](#)).

Delivery and business model

Refugee households in the camps receive a bank account and an ATM card. The money is paid out directly to the bank accounts according to the information in the UNHCR database, and refugees are responsible for updating their household information. Private banks manage



© UNHCR/Will Swanson

CONSIDERATIONS ON CBI FOR COOKING ENERGY

Assessments of cooking habits, spending patterns, and energy needs are essential to determine the modality of assistance and to ensure the sustainability of the programme.

The choice of an assistance scheme depends heavily on individual preferences, different ethnic groups or genders.

The population can initially show resistance in paying market prices for energy items when they are used to receive it as in-kind assistance.

The benefits of CBIs are heavily reliant on the availability of goods in the local market. Therefore, CBIs for cooking should be linked with other solutions seeking to increase the number of alternative cooking options (fuel and technology), including cleaner solutions than firewood.

CBIs are one of several delivery modalities UNHCR deploys to meet the need of refugees, but it has limitations. For example, when households cannot legally open bank accounts to access CBIs, or when local products are not available, in-kind assistance is still needed.

HOW TO REPLICATE THIS PRACTICE

STEP 1

Review existing CBI programmes in the country or region and identify how energy-related interventions can be linked to these programmes.

STEP 2

Conduct a market assessment to confirm that products are available in sufficient quality and quantity to meet the shift to market-based - instead of in-kind - provision.

STEP 3

Assess the cooking needs of refugee households to identify the appropriate amount and mode of assistance, paying particular attention to the needs of vulnerable groups.

STEP 4

Cooperate with financial service providers to distribute the CBI and integrate suppliers of in-kind assistance to enhance service provision and local businesses.

STEP 5

Align the CBI with other humanitarian interventions and make sure to well communicate the processes with refugees households

the bank accounts (e.g., KCB bank in Kakuma and Equity Bank in the Kalobeyei Settlement), and the first withdrawals or purchase of items with the cards is free. The transfer of funds is usually aligned with other interventions, e.g., concerning food and basic needs (UNHCR, [2022](#)).

Protection and health

Cash assistance has been critical for the wellbeing of refugees and others seeking international protection. In a 2021 [Post Distribution Monitoring](#) activity, 94% of respondents reported that cash assistance had improved their living conditions. Cash assistance also helped reduce feelings of stress for 92% of the surveyed households, showing that cash assistance can have an important, positive psychosocial effect too.

Acceptability

82% of the respondents used the cash to purchase firewood or cooking fuels, demonstrating that the measure was widely accepted (UNHCR, 2021). The cash must be enough to cover energy needs, and the supply of market-based goods needs to be ensured. In more remote locations, certain cooking fuels and equipment may be unavailable due to high transport costs and the lack of private sector interest, which undermines the effectiveness of CBIs.

Affordability

Generally, CBIs allows refugee households to spend the cash according to their preferences and budget for energy-related products. However, the aid must be enough to meet refugees' energy needs to avoid negative coping mechanisms such as skipping meals. Firewood and charcoal remain the primary cooking fuels in the Kakuma and Kalobeyei sites and provide an essential source of income for the host community. When support for clean cooking options, coupled with CBIs, reduces the demand for traditional fuels, humanitarian actors should support alternative livelihoods for fuel traders (UNHCR, 2021).

Self-reliance

CBIs increase refugees' independence on in-kind humanitarian assistance that often may only be available at certain times or locations.



"I started at a tree planting station before being promoted to the sustainable stove unit." Ariella Nitegeka is a Congolese refugee mother of six who lives in the Kakuma refugee camp. "I have worked with colleagues from other nationalities, including locals, for six years, and we have all become family."

© UNHCR/Pauline Omagwa

Refugees can buy cooking equipment and fuel from local markets, thus incentivizing entrepreneurs from refugee and host communities to engage in trade, generate income and make them more self-sufficient. Cash and sector specialists need to collaborate and strategically explore ways in which cash can best contribute to desired outcomes, alongside other forms of support ([UNHCR, 2018](#)).

Environment

CBIs allows refugee populations to purchase the most essential items that best suit their needs and cooking habits. This significantly affects long-term use of the stoves and reduces [stove stacking](#) (high number of various stoves stockpiled and unused). Higher and more extended use of the equipment results in less waste, which benefits the environment. Last but not least, CBI enhances opportunities for local purchase, avoiding heavy carbon footprint resulting from international supply and distribution for those items that can be found locally.

Lessons learnt from other UNHCR practices

Ethiopia



[Cash Based Intervention Dashboard](#)

In Ethiopia, the Refugee Cash Task Force set up a "Cash Based Intervention Dashboard" to coordinate and harmonize the implementation of cash assistance in refugee settings. In 2019, eight organizations reported ongoing cash activities in 16 settlements in Ethiopia, reaching around 130,000 households. The dashboard showed that there were differences in terms of conditionality (unconditional or conditional), modality (only cash, or cash and in kind, or cash and vouchers), and delivery mechanism (direct cash, voucher, bank accounts) across donors. CBIs for energy-related activities is still only 1% of the total assistance compared to other priorities.

Afghanistan



[Multi-Purpose Cash and Sectoral Outcomes](#)

Returnee monitoring reports showed that fuel expenditure for household heating was a substantial seasonal cash expenditure during the harsh Afghanistan winter. A variety of heating methods were used to keep warm, including a traditional domestic heating system, gas portable heaters, and wood or charcoal burning stoves. In both Kabul and Mazar, several interviewees also mentioned that they would often burn plastic items and trash, usually collected by children in nearby dumping sites, as they were unable to afford fuel materials. The report also found that part of the cash grants had been used to buy fuel for heating purposes and to buy winter jackets and warm clothes for family members.

Mini-Grid for Household Electrification

A solar mini-grid run by a private company supplies around 3,000 households, businesses and institutions in Kalobeyei settlement with clean and reliable energy. The mini-grid was first set up in 2019 and then expanded in 2022 to meet the high demand. A results-based financing component supports the business model which allows the private company to charge affordable prices. The stable electricity supply has opened up numerous business opportunities, created jobs and enabled a pilot project on electric cooking in the settlement.

Overview

In 2019, UNHCR and its partners established a 60kW solar mini-grid in the Kalobeyei settlement to provide affordable, safe, and reliable electricity to 347 households, 129 businesses, and 19 institutions. By 2022, the mini-grid was increased to a capacity of 541 kW to reach 30% of the settlement's population, with 2,276 households, 404 enterprises, and 36 institutions now connected (GIZ & UNHCR, 2022). A private company owns and operates the mini-grid. The settlement also has other solar power systems, including a 20 kW mini-grid in the host community and a 20 kW mini-grid in the nearby Kakuma refugee camp by [refugee-owned company Okapi Green Energy](#). The solar industry in the area is growing, as evidenced by the fact that all installed mini-grids have plans for expansion.

Technology details

Mini-grids present an attractive off-grid electrification solution when connection to the national grid is not available or feasible. A mini-grid is

The mini-grid in Kalobeyei settlement, run by Renewvia Energy, provides electricity to 250 households.

© UNHCR/Sebastian Rich



a system that produces energy on a small-scale using fossil (e.g., diesel generators) or renewable technologies (e.g., solar energy), or a combination of the two (hybrid), that distributes electricity within a local grid, such as a settlement or village. Solar mini-grids have a high installation cost but low operating costs compared to diesel generator alternatives. When the initial 'capital cost barrier' is overcome, solar mini-grids are a viable alternative to a diesel-powered mini-grid that has lower capital costs but higher ongoing operational costs. Renewable energy mini-grids are often equipped with energy storage solutions (batteries) or are coupled with a backup source (diesel generator) to provide electricity when the renewable energy is unavailable (i.e. night hours). A mini-grid is often mistaken for a "stand-alone system", which actually only supplies a single consumer, while a mini-grid distributes electricity to numerous facilities. (ARE, [n.d.](#))

Delivery and business model

The initial grant to cover capital cost helps incentivize a private partner to install and operate the mini-grid in the camp, and supply electricity at affordable rates (GCR, 2022). The upfront capital costs are covered by a results-based financing (RBF) component, while the tariff revenues cover

operation and maintenance costs. As part of the RBF, 30% of the grant support was paid out after the commissioning of the system, with the remaining 70% paid out based on the number of households that were connected. Refugees and host communities participated in installing the system, and then employed by the private company as locally-trained technicians in charge of maintenance. They also work as sales agents to handle relationship with the local customers. The private company installs pre-paid meters, sockets, and two lights for each new customer. After paying a connection fee of around 500 KES (USD 5.00), customers are charged according to their consumption per kilowatt-hour and pay through a mobile payment provider (IFC, [2022](#)). Tariffs vary for households 30 KES (0.24 USD) and businesses 35 KES (0.28 USD) respectively.

Protection and health

The existing diesel mini-grids that power the camps often come with several safety concerns, including the poor quality of the distribution network as well as exposed electrical wires, which pose fire risks and accidents/injury. The solar mini-grid is considerably safer as it is installed by a professional company following national safety standards. In addition, a stable electricity supply increases security in the camp, through



© UNHCR

CONSIDERATIONS ON MINI-GRID FOR HOUSEHOLD ELECTRIFICATION

The support of regulators and local authorities is crucial for the success of mini-grid projects. This includes the rights to use land where to install the solar system, operate in camps and sell electricity.

The owners of existing (diesel) mini-grids should be included in the initiatives, as their existing customer relations and know-how can be of great use while avoiding them to lose their business.

Hiring local staff for installation and operation provides income, increases technical capacities, and raises awareness and acceptance among refugee and host communities.

Mini-grid activities should be coordinated with other energy interventions, such as electric cooking, as future actions affect the sizing of the mini-grid and its useage.

End-of-Life considerations must be planned at the initial planning stage of the mini-grid programme to ensure the recycling and safe disposal of spare parts of the system.

HOW TO REPLICATE THIS PRACTICE

STEP 1

Review and meet the legal and regulatory provisions for mini-grids in the country and humanitarian settings, including land rights, supply permits, etc.

STEP 2

Set up a financing structure, including the terms of reference for results-based components, and engage suitable donors and private sector companies.

STEP 3

Identify customer needs and opportunities for stable revenues, e.g., by large commercial customers, and calculate cost-efficient sizing of the mini-grid system while also considering future growing needs.

STEP 4

Establish structures for maintenance and operation by including these components in the business model and training of local staff.

STEP 5

Regularly review the usage and capacity of the grid, and prepare for a scale-up of the system, if necessary.

reliable lighting at night. It also allows for households to switch from firewood to electric cooking as part of an electric pressure cooker (EPC) pilot, eliminating the harmful indoor smoke typical of open fire cooking. It also improves the quality of essential services provided in the camps, such as schools and healthcare facilities (GCR, [2022](#)).

Acceptability

Customers value the clean, reliable, and safe electricity supplied by a mini-grid and are willing to pay for the service (IFC, [2022](#)). Before the expansion, supply was curtailed due to demand exceeding the grid's capacity. Now customers receive a reliable 24-hour supply and are willing to pay higher prices. The acceptance among customers and other stakeholders has been high as the community were engaged in the electrification programme since the very beginning. This also meant that the mini-grid did not face any security issues, such as attempted theft or vandalism. The refugees employed know the language and needs of the community and can therefore offer tailored support and services.

Affordability

The grant component covering capital costs allows the private company to charge cheap tariffs while remaining competitive. The mini-grid fees per kWh of 30 KES (0.24 USD) for households and 35 KES (0.28 USD) for businesses are higher than the tariffs of the national grid (between USD 0.09 to 0.14 per kWh respectively) but much lower than the tariffs charged by existing diesel mini-grid operators. As a result, households in the camps spend an average of KES 400 (USD 3.60 per month) (IFC, [2022](#)). The electricity costs for households have been drastically reduced especially for families that have gained access to electricity for the first time and not having to pay for kerosene, firewood or candles.

Self-reliance

The trained local technicians repair and maintain all the electrical equipment in the camps for customers ranging from households to businesses to humanitarian actors and NGOs. This increases the self-reliance of the camp's population and the sustainability of solutions. Through access to reliable electricity, local businesses can extend opening hours and explore new market opportunities, e.g., the sale of electronic devices, cold beverages, phone charging services, among others (Baldi et al., [2022](#); GCR, [2022](#)). This increases their ability to provide services to the

community and raises their incomes, resulting in higher self-reliance for all stakeholders.

Environment

Supplying refugee households with electricity from solar mini-grids has multiple direct and indirect environmental benefits. When solar substitutes the diesel mini-grids, greenhouse gas and particle matter emissions are reduced. Access to reliable electricity allows households and businesses to store food, produce less waste and cook with cleaner technologies. Lastly, with a stable electricity supply, electrical appliances are less prone to damage caused by fluctuating power surges, thereby reducing more costs and waste on replacement appliances.

Lessons learnt from other UNHCR practices

[Solar cooperatives in Ethiopian refugee camps](#)

In 2017, UNHCR equipped solar mini-grids in all five Dollo Ado camps in south-eastern Ethiopia. As a result, the mini-grids became the leading electricity suppliers in the camps, supplying households, businesses, and the camp administration team. Local cooperatives, made up of trained refugees and host community members, generated income from the sale of electricity, with revenue used to pay its members and invest in new equipment. Vulnerable households received electricity for free, and UNHCR helped the cooperatives procure spare parts unavailable locally. (ESI Africa, [2020](#)). ■

Ethiopia



Solarization of Schools

Since 2021, UNHCR has solarized 53 institutional facilities in Kenyan camps, including 37 schools. Some of these schools are part of Vodafone's Instant Network Schools programme, which supplies schools with solar photovoltaic energy for electricity generation, multi-media equipment, and internet connectivity to enable digital learning. Access to electricity in schools heightens educational outcomes and teacher retention, among other benefits for the community.

Overview

Teachers in many African schools often lack the resources to teach large groups of pupils of different ages and ability. This situation is further exacerbated in refugee camps, which are often situated in remote, structurally weak areas with unfavourable learning conditions. In a long-standing partnership which began in 2013, UNHCR and the Vodafone Foundation have set up 84 Instant Network Schools (INS) in key urban and rural locations. The INS schools act as a 'multi-media hub' for learning with a local network, internet connection, digital resources, and electronic devices such as tablets and projectors (UNHCR, [2022](#)). The equipment is powered by electricity produced locally from solar panels. The programme is active in Kenya, DR Congo, South Sudan and Tanzania, and has reached more than 86,000 students from refugee and host communities and 1,000 teachers. By 2025, the programme is targeting two more countries (Egypt and Mozambique), aiming to install 300 INS, thereby reaching 510,000 students and 10,000 teachers ([GCR](#), n.d.).

Technology details

For the solarization of institutions, UNHCR uses 15 kW solar PV capacity and lithium-ion batteries with 25 kWp / 88kWh capacity for storage. These systems provide enough electricity to meet the needs of the schools, including lighting, digital learning, printing, and lighting the teachers' accommodation. Excess electricity can be used for institutional cooking and high masts provide public lighting at night. Solar photovoltaic systems are ideally sized for the needs of institutions and can offer lifetimes of up to 20 years at minimum. For Instant Network Schools, multi-media cases safely store the devices and act as connection points to the Internet. The boxes provide 25 tablets, a laptop, a speaker, a projector, cables, chargers, and the network equipment, including gateway, access point, and server.

Delivery and business model

The INS programme started with 13 pilot schools in the Dadaab camp in 2013. A major feature of the project is its community-driven approach which considers the needs of the local population and its focus on ref-



CONSIDERATIONS ON SOLARIZATION OF SCHOOLS

Access to electricity and the internet helps retain teachers and reduce the high turnover of staff in isolated and humanitarian settings.

A solar PV system combined with battery storage is ideal to ensure continued supply during cloudy days and additional activities at night, converting the schools into community hubs.

Awareness-raising and theft-preventing installations can reduce the risks of vandalism and thefts that jeopardize the system's functioning.

The maintenance, repair, and replacement of equipment should be part of the programme, as regular maintenance checks can prolong the lifetime of the equipment.

The project needs to consider the entire lifecycle of the solar equipment, including long-term maintenance and operation, as well as recycling, reuse, and safe disposal of electronic waste.

Congolese and CAR refugee students attend a class with the support of tablets and laptop provided by Vodafone Foundation and UNHCR through Instant Network Schools. Thanks to the tablets and a reliable internet connection they can access resources and learn in a more entertaining and innovative way.

© UNHCR/Vittoria Moretti

HOW TO REPLICATE THIS PRACTICE

STEP 1

Coordinate efforts with national and local stakeholders to ensure alignment with development plans and education priorities, and obtain the necessary permits.

STEP 2

Identify suitable schools or other implementation sites. This includes the technical feasibility as well as a prioritization of activities.

STEP 3

Conduct community workshops, surveys, and similar means of engagement to incorporate the needs and priorities of the population.

STEP 4

Design the system size to include the integration of different uses. Further, estimate an increase in energy consumption at the system sizing phase.

STEP 5

Train local staff in the maintenance and repair of the system, to ensure long-term safety operation. Consider maintenance and replacement in budgeting and contracting.

ugee and host communities (UNHCR, 2022). A local coach is appointed for each INS school, supporting both pupils and teachers. The school is constantly monitored to ensure the solutions provide the intended benefit. The Vodafone Foundation (VF) provides funding and human resources to the programme, and draws upon Vodafone's knowledge and expertise in the telecommunications sector. Local Vodafone staff help train volunteers while UNHCR matches the VF's financial contributions (GCR, n.d.). In addition, UNHCR sets up operation and maintenance contracts with companies that installed the systems as well as a training programme for refugees to become technicians.

Protection and health

Renewable energy solutions benefit childrens' education and well-being in numerous ways. For example, providing light after sunset allows students to study at night ([Protection-Sensitive Access to Lighting](#)) alongside increasing the safety of women in public spaces. When women and girls gain access to information through electrification, for example, on the radio or the internet, they better understand their rights. They are also more likely to resist harmful gender stereotypes (Power Africa, 2017). The electrification of public buildings can also help serve the community at night or during emergencies. For example, during the flooding in the Dadaab camp, a solarized school became a necessary point for meetings as it had access to electricity (UNHCR, 2017).

Acceptability

The programme has increased school attendance (UNHCR, 2022), highlighting the positive reception of improved education services by the population. In addition, as the projects target both host and refugee communities, refugees become better integrated (GCR, n.d.) and the acceptance by host communities can improve. Access to electricity is also associated with higher teacher retention as it improves overall working conditions (UNICEF, n.d.).

Affordability

The INS programme supports host countries by investing in (digital) education infrastructure (GCR, n.d.). As a result, students and teachers can access the equipment and services without costs, enabling free access for everyone. When solarization efforts are not based on grant assistance, a viable business model must be found to ensure the long-term



?

© UNHCR

operation of the solar mini-grid. Supplying one or several customers near the school can present a reliable revenue model to fund operation and maintenance activities to sustain the system in the long term.

Self-reliance

In monitoring reports, several positive impacts of INS have been identified. Pupils and teachers increase their digital literacy, confidence, and motivation and critically, students improved their academic performance (GCR, n.d.). In addition, the programme opens access to education and better job prospects and increases interest in higher education and career aspirations (UNHCR, 2022). These benefits increase participants' self-reliance and their future opportunities. Electrified schools also benefit the wider community, as they act as centres for community activities and meetings, offer adult education, and host national exams after school hours.

Environment

Using solar panels to produce electricity is much cleaner than diesel generators or other 'traditional', non-renewable models. However, environmental sustainability is impacted by end-of-lifetime reuse, recycling, and e-waste processes, and these factors should be considered in the system planning phase.

Lessons learnt from other UNHCR practices

Tanzania



[Connectivity supports the education efforts of refugees](#)

In Ethiopia, the Refugee Cash Task Force set up a "Cash Based Intervention Dashboard" to coordinate and harmonize the implementation of cash assistance in refugee settings. In 2019, eight organizations reported ongoing cash activities in 16 settlements in Ethiopia, reaching around 130,000 households. The dashboard showed that there were differences in terms of conditionality (unconditional or conditional), modality (only cash, or cash and in kind, or cash and vouchers), and delivery mechanism (direct cash, voucher, bank accounts) across donors. CBIs for energy-related activities is still only 1% of the total assistance compared to other priorities.

Mozambique



[Tailor-made solar solutions for classrooms](#)

In Mozambique, the number of INS classrooms has been steadily increasing, with 15 INS centres in 12 schools in the Nampula province (Victron Energy, 2022). Since the schools are often in remote areas without access to the national grid, each receives a tailored solar solution to meet its present and future electricity needs. The Ministry of Education supports the efforts and benefits around 57,000 students and 1,000 teachers. A longitudinal evaluation study, lasting until 2026, is being conducted to assess the impact of the INS programme in Egypt, Mozambique and Tanzania (Samuel Hall, 2021).

Cover photo:

The refugee-owned company Okapi Green Energy harnesses sunlight to provide reliable and affordable energy to 200 refugee businesses and homes via a mini-grid in Kakuma Refugee Camp. The owner, Vasco Hamisi, a refugee from the Democratic Republic of the Congo, is taking a lead in supplying clean and sustainable energy to part of the camp. The company also provides internet connectivity to customers.

© UNHCR/Samuel Otieno



© United Nations High Commissioner for Refugees
June 2023

UNHCR, Private Partnerships and Philanthropy
UN City, Marmorvej 51
2100 Copenhagen Ø
Denmark

www.unhcr.org