



Altech: Project lessons and outcomes



Grantee:

Altech Group is a Congolese enterprise that offers a range of solar energy solutions to expand access to clean, reliable, renewable and affordable energy for off- and poor-grid households. Altech's aim is to improve the lives of communities at the bottom of the socio-economic pyramid while building Africa's largest distribution network for clean energy solutions.

Project:

Altech received a grant from the GSMA Mobile for Humanitarian Innovation Fund to support its Distributed Energy Services for Refugees (DESREF) project, providing distributed energy services to Burundian refugees living in Lusenda and Mulongwe refugee camps in Eastern Democratic Republic of the Congo (DRC). Through their pay-as-you-go (PAYG) model,

refugees can acquire a solar home system (SHS) without any down payment, and pay for it in small daily or monthly instalments using mobile money. By providing low-cost clean energy solutions, the project aimed to improve the living conditions and economic well-being of these refugee communities.

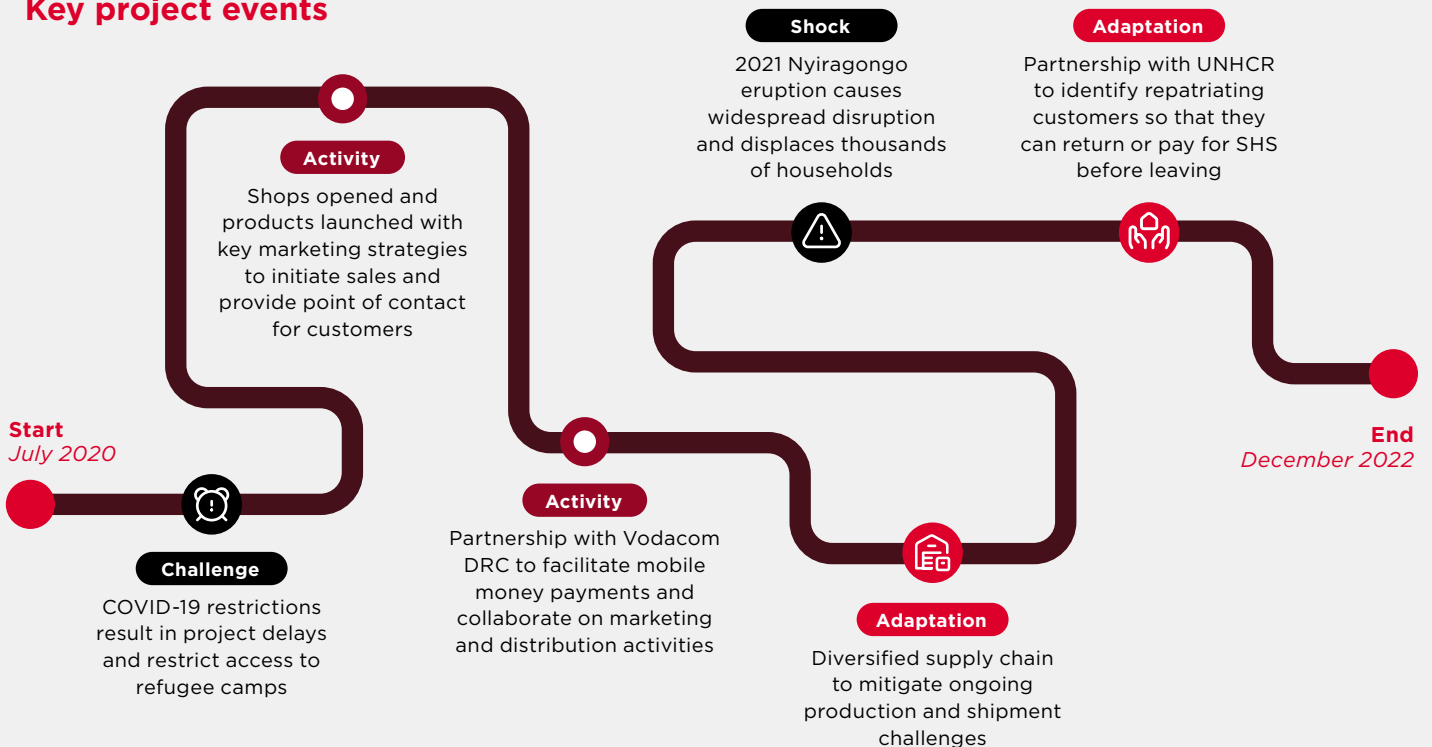
Grant details:

- July 2020 to December 2022
- Mobile for Humanitarian Innovation Fund grant of £127,000

Partners:

Vodacom DRC as mobile network operator (MNO) partner to integrate M-PESA mobile money payments, Omnivoltaic as hardware supplier for the SHS, and Angaza as service enabler for PAYG technology.

Grant timeline: Key project events



Project background

In rural DRC, where the Lusenda and Mulongwe refugee camps are located, the rate of electrification stands at less than one per cent.¹ DRC-based Burundian refugees living there consequently rely on candles, kerosene lamps and diesel generators to provide lighting or electricity for phone charging. The use of these expensive and dirty energy sources can have damaging economic and social impacts on these communities. Through Altech's PAYG model, Burundian refugees in the DRC can acquire an SHS without any down payment, and pay for it in small daily or monthly instalments using mobile money. This approach eliminates the high upfront payment barrier that has previously prevented many refugee households from accessing clean and reliable energy. The Altech SHS includes an 11W solar panel, a 37.44Wh lithium battery, four bulbs, a four-in-one phone charging cable, a radio and a torch. By replacing candles, kerosene lamps and diesel generators, it is hoped that the SHS will not only reduce customers' household costs but also improve their overall standard of living.

Project timeline details



COVID-19 restrictions

Global lockdowns and movement restrictions caused delays in both the production of SHS in China, where they were manufactured, and the delivery of orders to the DRC. Additionally, national movement restrictions at times prevented Altech staff from accessing the Lusenda and Mulongwe camps. When it became clear that stock delays were likely to be ongoing, Altech proactively addressed the challenge by ordering and carrying more in-country inventory to overcome unpredictable lead times.



Shops opened and products launched with key marketing strategies

Altech opened shops and warehouses in the Lusenda and Mulongwe refugee camps, ensuring 1,000 SHS were in stock before sales could begin. Initial awareness about solar products and the mobile money payment system was limited, which Altech addressed by recruiting and training field staff and 'solar ambassadors' to promote the benefits of SHS ownership and the payment system to wider communities. Key marketing strategies around the launch included radio advertisements, door-to-door flyer distribution, and engagement and product demonstrations with village leaders.



Partnership with Vodacom DRC

Altech initially partnered with Vodacom DRC to facilitate mobile money payment for customers, integrating M-PESA into Altech's customer relationship management system and including Altech on the M-PESA menu. They also collaborated on training M-PESA and Altech agents on marketing, distribution, and sales to encourage new customers to sign up to both M-PESA and Altech products. When it became apparent that Altech customers were being charged fees for making deposits on their accounts, Vodacom agreed to update their terms so that fees were no longer charged.



Diversified supply chain to mitigate potential delays

Altech initially ordered 2,000 SHS units from a US-based company with factories in China and received the first 1,000 units in August 2020. However, the second batch faced delays, with US sanctions on China limiting the company's access to key components necessary for the SHS. Ongoing global shipping congestion due to the pandemic worsened the delays. To overcome these hurdles and ensure an uninterrupted supply of SHS production, Altech engaged a Dutch-owned company with factories in China that would not be affected by similar sanctions.

1. World Bank (2020). [Increasing access to electricity in the Democratic Republic of Congo. Opportunities and challenges.](#)



Response to the Nyiragongo volcanic eruption

In May 2021, the Nyiragongo volcano erupted, releasing ash and lava across Goma. At least 31 people lost their lives, 41 people were reported missing, and upwards of 4,500 households were displaced. Altech extended support to staff and customers during this difficult time. For example, when Goma authorities ordered an evacuation of the city, Altech made advance payments to staff and ambassadors to allow them to leave the city, regardless of whether their location fell within the designated evacuation zone. Altech also called all SHS customers based in Goma to get an update on each individual situation and to provide essential service support as needed.



Partnership with UNHCR

The United Nations High Commissioner for Refugees (UNHCR) initiated a voluntary repatriation programme, whereby camp residents could be supported to return to their homes. This however posed a challenge for Altech as some customers who choose repatriation were taking the SHS with them without completing their payments, and unknowingly immobilising their SHS. Altech addressed this challenge by partnering with UNHCR, whereby UNHCR informed Altech about customers choosing repatriation, which enabled discussions to return or pay for SHS in full before leaving.



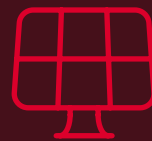
End of the grant

During the grant period, the project:



**Opened
130**

new sales outlets



Sold more than
1,420 SHS



**Operated in five
project locations**

Lusenda Camp, Mulongwe Camp, Lusenda village, Sebele and Baraka



**Impacted
over 7,000**

lives with access to clean energy



Project outcomes and lessons

Outcome

Improved energy access and overall living conditions

Altech conducted an endline survey² to collect evidence on project outcomes. The main benefit reported by Altech subscribers was improved access to reliable energy. The high-quality lighting powered by the SHS helped customers to complete various household activities after dark, with the SHS lasting more than five hours between charges. Parents found the additional lighting helped their children complete studies and homework, and having access to the radio also enabled users to keep up-to-date with national and international news. Finally, being able to charge phones in the comfort of their homes instead of visiting charging stations also saved them time and energy.

"I have four Altech lamps at home which I use to prepare food in the evenings while my children revise for their lessons. Also, when I had to recharge my phone at a charging station, I had to walk three kilometres each way and then wait while it charged. Now I can recharge it in my house, meaning I don't have to be so careful with what I am using it for and how much battery I have left."

- Female Altech customer, Mulongwe

Outcome

Economic benefits experienced by SHS users

A number of users reported that the SHS enabled them to save money on their overall energy costs. Recharging their phones at home not only saved money on charging costs but also on transport costs to the charging stations. They also saved money when using other battery-powered devices that ran off the SHS instead. Thirty-six per cent of users reported using the SHS to provide light for their business at night, allowing them to extend their trading hours past sunset. This not only improved their safety but also provided an opportunity to increase their income.

"Before, I used the lamps sold on the market; they would regularly break and the batteries cost a lot. Now my lights are powered by the sun I don't have any more battery expenses! I also like that I don't have to go to the kiosk every time I need to charge my phone, the money I used to spend doing this now stays at home."

- Female Altech customer, Lusenda

2. Altech endline survey data was collected from 201 Burundian refugee participants across Lusenda and Mulongwe (166 male and 89 female).

Outcome

Subscription PAYG model increased uptake of SHS

Customers surveyed by Altech during the project³ said the PAYG system was one of the main factors that motivated them to buy the Altech SHS. Ninety-two per cent of users reported that they appreciated the PAYG model because they did not have to provide full payment upfront and 89% of users found the Altech model to be affordable. A number of users also highlighted that they would not have been able to afford the full payment upfront and consequently would not have been able to benefit from the SHS.

"I recently subscribed to a solar home system and am now in the process of paying for it. The PAYG model allowed me to purchase the system, enabling me to save money compared to buying something similar elsewhere."

- Male Altech customer, Lusenda

Lesson

Limited disposable income still prevents wider uptake of SHS

Despite subsidised costs and a more accessible subscription model, the economic conditions for Burundian refugees and their host communities still makes SHS too expensive for wider uptake. The majority of non-subscribers surveyed reported that they were unable to use SHS because they did not have the necessary disposable income. This was confirmed by the UNHCR who reported⁴ that many Burundian refugees in Mulongwe and Lusenda are dependent on humanitarian

assistance. The baseline⁵ study conducted by Altech indicated that 75% of the target market rely on subsistence farming for their livelihood, where food is primarily grown for their own consumption and only leftovers are sold to the wider community. The average monthly income for these people was found to be between \$0.50 and \$1.50, with most households reporting their three biggest expenditures as food products, medical bills and existing loan repayments.

Lesson

Understanding how users cover monthly payments

Altech realised that refugees were using financial assistance from UNHCR to help make their monthly SHS payments. However, as there are sometimes delays in the disbursement of this financial assistance, it can cause customers to default on their payments. When a customer fails to make a monthly payment, the PAYG

system automatically switches off the SHS until the payment can be made. As this problem affects 30% of Altech's customers each month, they are now working with UNHCR to explore the possibility of extending the window of payments for customers who rely on their financial assistance.

3. Altech midline survey data was collected from 250 Burundian refugee participants across Lusenda and Mulongwe (139 male and 111 female).

4. See: <https://reporting.unhcr.org/node/10210>

5. Altech baseline survey data was collected from 457 Burundian refugee participants across Lusenda and Mulongwe (231 male and 226 female).

Conclusion

Despite many challenges and obstacles, Altech have been able to successfully provide off-grid low-income refugees and host communities in Lusenda and Mulongwe with access to clean and reliable energy. The digitalisation of their payment processes helped them to operate in these complex contexts, with the incorporation of M-PESA increasing access to customers who can afford payments using ongoing instalments. Their multi-use SHS appeals to a wide market base, and by the end of the project, demand for the system continued to exceed their available supply. The project has proven that their business model works, and they are able to generate the necessary revenue to operate at a profit. Overall, the outcomes have also shown that access to clean energy can improve users' economic well-being, living conditions and overall quality of life.

What's next for Altech?

Since the end of the grant, the Altech team has continued their work to bring clean and affordable energy to households across DRC, distributing over 270,000 solar products and positively impacting 1.35 million lives.⁶ Altech now operates in 21 of the DRC's 26 provinces and has successfully established itself as a leading provider of solar power solutions to off-grid communities across the country.

In September 2022, they were awarded \$1.5 million in additional funding from the Humanitarian Grand Challenge: Creating Hope in Conflict.⁷ This partnership funding will enable Altech to further improve access to clean energy in the DRC while creating employment opportunities, economic prosperity and access to finance. As a testament to the success of the funding and support received to date, in 2023 Altech was ranked fourth in the Financial Times list⁸ of fastest-growing companies in Africa.



6. Energise Africa (2022). [Altech awarded \\$1.5M to provide affordable, clean energy solutions in the Democratic Republic of Congo.](#)

7. Humanitarian Grand Challenge (2022). [Altech awarded \\$1.5M to provide affordable energy solutions in the Democratic Republic of the Congo.](#)

8. Financial Times (2023). [FT rankings: Africa's Fastest Growing Companies 2023](#)

Data sources

- Project milestone reporting and final grant report
- Altech's project baseline, midline and endline studies
- External MEL report by The Research People included key informant interviews and a reflective learning session with the Altech and GSMA teams in November 2022