Project funded by the GSMA Mobile for Humanitarian Innovation Fund

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GRANT PROJECT LESSONS AND OUTCOMES

Community Solar Hubs

GRANT PROJECT DATES

May 2019 - November 2020

United Healthcare Distributors (UHD) is a leading Ugandan distributor of consumer goods, partnering with VAC Solar, an Anglo-Belgian group with the distribution rights for POPO technology.

Using a grant from the GSMA Mobile for Humanitarian Innovation Fund, the partners developed the Community Solar Hub Project, a rental network using using the innovative POPO battery solution to increase access to affordable, reliable power in Arua, Kokobo and Rhino Refugee Camp in northern Uganda.

Short for "portable power", POPO provides low-cost and flexible access to energy through a secure and scalable battery rental platform, requiring no deposit, credit-checks, or fixed payment structure. The portable battery is lightweight, lockable and tamper proof. Additionally, POPO make use of Near Field Communication (NFC) and mobile technology (mobile money and networked-IOT) to facilitate payments as well as to track and measure battery usage.

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DETAILED PROJECT DESCRIPTION:

The model works by putting solar panels on community buildings, such as rural health-centres, which act as secure community solar hubs for charging and distributing batteries. Charged batteries are rented out to customers by self-employed 'lessees' who earn a commission from each sale. Over a 30-hour rental period, customers can use a battery to charge phones, power appliances, light homes, and more. Using the POPO app, lessees and hub managers can monitor battery charging, track battery locations and lock/unlock batteries for usage fully remotely.

GSMA grant funding was used to further develop its model for improved end-user outcomes and pay-per-use to reach commercial sustainability, which would mean the ability to permanently provide services. An additional grant was provided in order to adapt to COVID-19 pandemic, enabling them to adapt their distribution model to operate in a safe and responsible manner as well as complying with Government of Uganda requirements.

KEY STATS

On average, nearly

5,000

batteries were rented per week

3,750

households rented a battery at least once

90%

of customers said batteries last at least 6-hours

47 men
21 women

gained income through battery distribution

25%

of customers used batteries to generate income



Sarah* is a 24-year South Sudanese refugee living in Rhino camp with 5 relatives. She is the head of her household and earns a living selling food in the trading centre where she earns between UGX 1,000 and 50,000 a day. Before using POPO, she did not have a power source in her house and she paid UGX 500 to charge her smartphone at the charging stations in the trading centre. POPO is her only source of power and she uses it for lighting her home, charging her phone and radio. Using the batteries has enabled her to charge her smartphone without fear of it getting lost or stolen at the charging stations, as it has before. With her phone charged, she is able to chat with her friends for a longer period, take photos and play games.

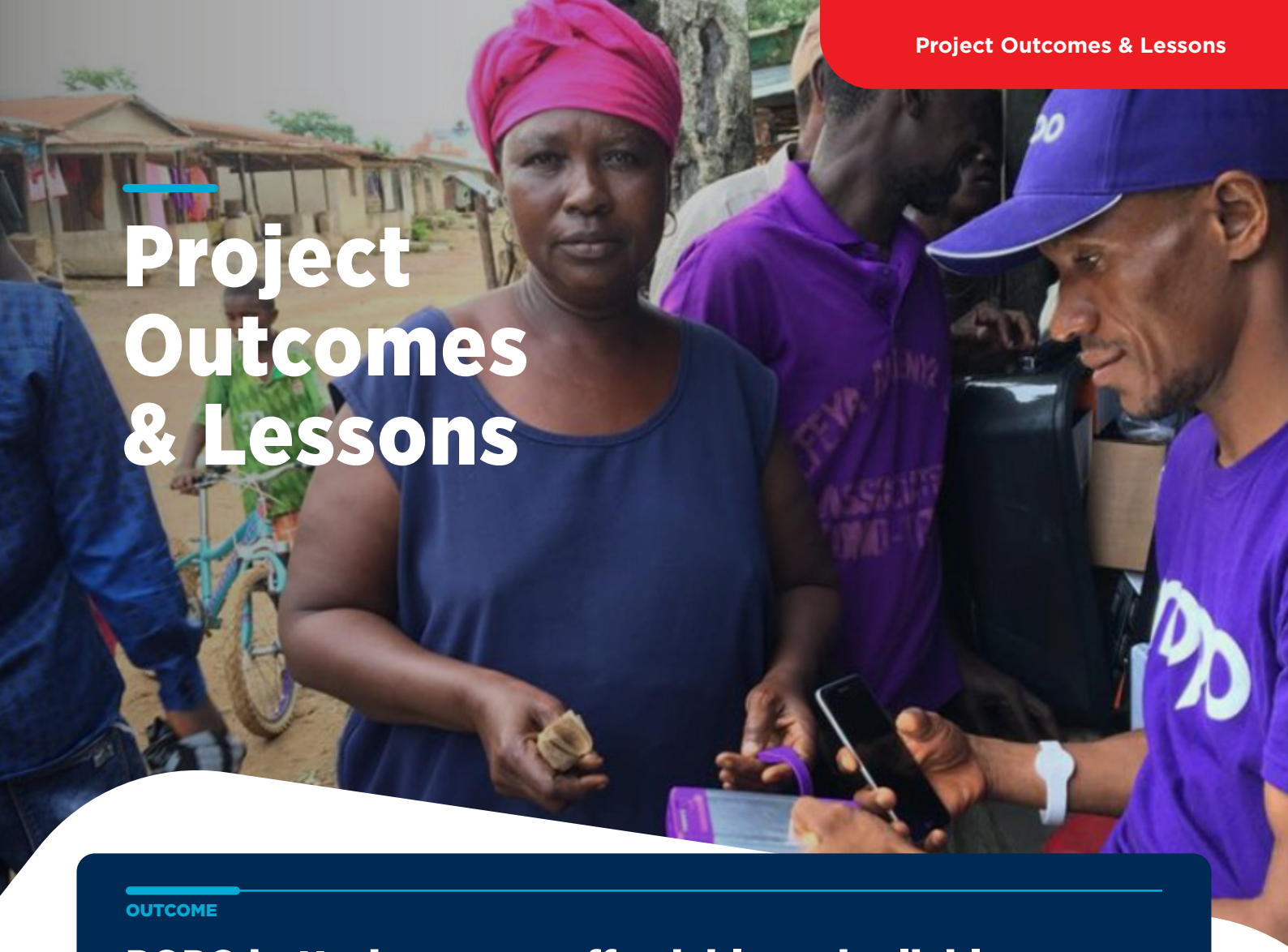


Obua* is an accountant in Koboko. For more than two months, he has used POPO alongside his solar home system to charge his smartphone and provide light for his household. He likes it because it is cheap, portable, multipurpose and he does not have to spend money on charging his phone at the market. Before he started using POPO, he had to limit the use of the internet on his phone because the phone battery ran out so fast, but with POPO he can *"do anything for all the hours I need... now that I can charge, I can use the internet for as long as I need."* He is able to use social media longer to connect with his team and the customers in his business; a rental car and transport service. He uses POPO more than his solar home system because it is portable. He would like to be able to rent a bigger battery which can charge more appliances like a DVD player and a screen.



Michelle* is 24-years old, she has been distributing batteries for more than 6-months. She likes her lessee role because she feels like she is *"helping the people in my area who do not have power"*. Michelle was unemployed before taking on the lessee role, *"But now, thanks to POPO, I have a job. I do not depend on anyone. I am able to provide for myself."* When the project resumed in July 2020 after the COVID lockdown, she was happy that she got her own distribution point (DP) because it made her "feel safe". Michelle gives half of her earnings to her parents which contributes towards her brother's school fees. She was also able to hire a 16-year-old male assistant to work with at the DP. She says, *"his parents requested that I work with him because he is not going to school at the moment as schools are closed to make sure that he doesn't join bad groups."*

*Names have been changed.



Project Outcomes & Lessons

OUTCOME

POPO batteries are an affordable and reliable source of energy

During the grant period, 3,750 households rented batteries 16,880 times, gaining access to clean energy to charge their phones, light their homes and extend business hours.

Many customers noted that the batteries were of a higher quality than their previous energy source, reporting that their phones charged faster compared to using charging points in the market. It also meant that users were able to save the 500UGX cost of using charging points in the market.

"I have benefited in so many ways, such as being online throughout the day whenever I want, now I can chat with friends for a long time without my phone running out of power"

Customers also reported using POPO to light their homes and businesses, enabling them to stay active or open longer at night. A customer satisfaction survey indicated that 25% of users reported that their income had increased from using the batteries, either through extending their business hours, or being able to better communicate with their customers.

"I am so pleased that POPO came to Arua. I can now rent a battery to use in my shop and in my home so I can work and read at home at night. The bright light in the battery makes me feel very safe when I walk home in the evening"

OUTCOME

The model allowed lessees to earn income

The project demonstrated that for high-performing lessees[1], assistants and hub managers there is potential to earn a sustainable income through battery rentals. Several lessees interviewed as part of the project evaluation, particularly those without stable incomes before being part of the project, reported being happy to earn some daily income, as it helped to cover costs of daily expenditures. The project team reported that 67 derived some income from the project: 33 lessees, 30 assistants and 4 hub managers.

"I am very grateful for the POPO Solar hub project. I can now raise money to continue with my further education and support my parents."

However, it is important to note that at the time of the project evaluation, the average volume of business[2] was insufficient to provide a sustainable income in isolation. Many lessees and assistants needed further income streams. Some lessees reported capitalising on their popularity and mobility as a POPO to market and promote other products and services simultaneously.

"[my lessee role] has made me get known by many people which is good for my events management business. I use the time when I am distributing the battery to market my business."

LESSON

The project demonstrated promise for the role of mobile money, particularly among lessees. For battery users though, cash remained the preferred payment option.

For POPO the digitisation of payments within their battery rental operational model, in this case via mobile money, means they are able to keep an accurate record of the number of batteries activated and reduce possible issues with fraud. All lessees use mobile money, alongside the POPO app, to acquire credits and activate batteries for their customers. Lessees reported this being a convenient and efficient way to make payments, though acknowledged that they sometimes faced issues which negatively impacted their ability to properly serve customers. At the customer level, fewer have shifted from cash to mobile money payments; data from the project's evaluation shows that 87% of customers still prefer to pay for POPO battery rental using cash. Mobile money transaction fees are likely to be one of the main barriers, since the target customers, mostly at the base of the pyramid, are likely to be price sensitive.

1. Lessees need to rent out more than 2,700 BPs per month to earn enough to provide for a family of 4-5. The 2016/2017 Uganda National Household Survey (UNHS) reports that the average household (consisting of 5 people) monthly expenditure is 325,800 UGX (USD 89).
2. This is a high-volume low-margin business, due in large part to target customers' limited ability to pay for the service, meaning there is little flexibility in price# and commission structure.

LESSON

Whilst more women were brought on during the course of the grant project, mainly as assistants to lessees, UHD found onboarding female lessees difficult due to the requirements of the role.

The original project plan put a focus on onboarding female lessees, and while significant effort was made to attract female lessees, at the time of the evaluation they were but a small proportion (24 males versus 9 females). With key hours of operation being after dark, many women had safety concerns and others had work at home during this timeframe. Transporting the batteries also requires physical strength, often perceived to be work more suited to males.

As part of the GSMA grant, lessees were encouraged to hire an assistant to stay at the distribution point and serve customers, enabling lessees to go out into the community on sales drives. This adaptation generated an income stream for 26 assistants, of which 14 are female. Whilst it is positive that more women have begun to work on this UHD project, the project evaluation showed that assistant work was not always fairly remunerated. Assistants are recruited directly by the lessee and so are subject to their ways of working, with no clear code of conduct. For example, a lessee noted that they remunerated their assistant with "transport or soda". Another lessee reported that they procure the services of their assistant only when they themselves are unavailable to work, and paid them 3,000 UGX (USD 0.82) per day which is equivalent to activation of 30 BPs per day regardless of how many BPs they activate.

LESSON

Easing distribution challenges by increasing customers' accessibility to 'centralised' distribution points, as well improving stock management, have been crucial to achieving commercial sustainability in this battery rental business model.

One of the main challenges for lessees is distributing the batteries to end-users, especially if there are large distances between users and the hub. UHD used part of the GSMA grant to ease some of the battery distribution challenges in a bid to improve battery turnaround times and ultimately increase the number of rentals. Their approach was two fold; (1) encouraging lessees to rent out more 'centralised' distribution points, rather than going door-to-door delivering batteries and (2) organising dedicated transport to take batteries from distribution points to hubs for charging.

These measures proved successful in more densely populated areas such as Arua and Kokobo, as the investments made in easing distribution challenges were offset by a significant increase in the number of battery rentals. However, in the more sparsely populated Rhino camp, which covers a large geographical area and has poor roads, the project is not commercially viable unless losses are off-set by other revenue-earning sites or the project is supplemented by philanthropic capital, due to the heavy investments required in establishing hubs, distribution points and dedicated transport.

What's next for POPO

- POPO is continuing its journey to scale through replicating the model across different off-grid regions of Uganda, increasing the number of batteries available for rental, aiming to have at least 60,000 batteries in circulation within three years. They are also working on attracting impact investors to underwrite the cost of equipment in remote refugee areas, and enhancing partnerships with mobile network operators to negotiate transaction fees based on large scale rental business. POPO is also looking at providing batteries to business/organisations, for example to support education and healthcare providers, for e-travel or in agricultural settings.
- POPO is working on improving the batteries and associated technology, to ensure strong reliability for both customers and lessees. For example, by assessing how the business data captured via the POPO app regarding rentals, unlocking and battery power can be leveraged to generate business insights and drive process improvements.
- POPO is working on improving the operating model, to be able to attract more female lessees, who are currently underrepresented.
- Since the grant project, the partners established POPO as a joint venture business in Uganda which is commercially sustainable **www.popoafrica.org**

Methodology for project evaluation

The project evaluation was conducted by The Research People, on behalf of the GSMA. Remote telephone interviews were conducted with UHD program staff, lessees, users and hub hosts. A total of 45 people were interviewed. The interviews followed a semi-structured template with open ended questions and lasted approximately 30-40 minutes. Interview questions were qualitative and explored the experience of the beneficiaries, distribution models and recommendations for UHD. Evaluation data was triangulated with UHD's reporting from their product data as well as some internal customer surveys.

DATA SOURCES

- **UHD project reporting**
- **Evaluation conducted by The Research People on behalf of the GSMA:**
  - Remote interviews with 4 UHD program staff; 4 hub host representatives in Arua, Koboko and Rhino camp (Ocea and Ofua Zones) respectively; 12 lessees (8 male and 4 female); hub managers (2 male and 2 female); 21 battery pack users (12 male 9 female).
  - Evaluation data was triangulated with UHD's reporting as well as some internal customer surveys. (12 male 9 female).