Profile: Devergy

Using pay-as-you-go solar micro-grids in Tanzania to provide rural consumers with affordable energy

Challenge

Tanzania has one lowest electrification rates in the world. Just 14 percent of its people—a mere 3 percent in rural areas—has access to electricity (World Bank n.d.)

This solar panel mounted on a tripod provides affordable energy to households in a Tanzanian village.

The main sources of energy in rural areas include traditional biomass, kerosene, and batteries, which are not only expensive but also pose environmental, safety, and health risks. Lack of access to regular supply of power also hinders rural development. Utilities either lack the financial capacity to expand their grids to isolated rural areas or choose not to so because of the low potential return on investment.

Innovation

Founded in 2010, Devergy (http://www.devergy.com/) provides energy services through low-power solar micro-grids that are typically shared by up to five households. The modular nature of the product allows the company to optimize the size of the system to meet the exact demand of users, which, at least initially, typically use it only to charge their mobile devices or provide lighting, avoiding the "oversizing" often associated with traditional mini-grids.

Devergy covers the installation cost of the micro-grid, except for a small fee charged at the time of first connection. The initial investment ranges from USD 6 to USD 12, which covers metering, wiring, two LED bulbs, and installation. The balance is built into the per-use energy charges paid by users. This arrangement makes Devergy's proposition for the end-user more favorable than solar home systems, which require higher upfront capital outlays. The payback period of a Devergy system is about two and a half years.

Devergy uses differential pricing based on users' purchasing power. It charges better-off customers a higher price in order to cross-subsidize the tariffs of lower-income customers. Prepaid energy packages start at USD 0.20 a day.

The systems generate energy in direct current (DC), saving 20 percent of the system costs by eliminating the need for a costly inverter. As most electrical appliances available in the markets are made to run on alternating current (AC), Devergy also supplies energy-efficient DC products (lighting products, refrigerators, TVs).

A key feature of the system is the household energy meter. Users can top up the energy account by buying Devergy vouchers from local stores, from Devergy engineers in the village, or through mobile money. Selling energy based on hours of light, phone charging, or other applications makes it easier for customers to choose the services they want and monitor their consumption.

Devergy uses a community-based communication approach, which makes users a part of the decision-making process from the start of a project. Meetings with villagers, elders, and leaders are held to discuss and assess users' needs.

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This series on Inclusive Innovations explores business models that improve the lives of those living in extreme poverty. Editors are Elaine Tinsley and Natalia Agapitova. Researched and developed by Intellecap.

Impact

Devergy has connected about 1,000 households in six villages to its solar grids, providing them with access to cleaner, safer, and less expensive energy. More than new 100 households in Tanzania are being connected every month.

Rural residents in Tanzania typically spend USD 6–25 a month on kerosene, phone charging, and zinc-carbon batteries for radios. After installation of Devergy's micro-grids, they spend as much as 20 percent less than they had been spending on kerosene for lighting and about 50 percent less for phone charging.

One of the key impacts of access to energy is stimulation of economic activities by allowing local stores, restaurants, and small-scale manufacturing units to operate for longer hours. Micro-grid energy also overcomes the risk of fire and accidents caused by kerosene use, and the lighting it provides allows children to study at night. Lack of a proper disposal system for zinc-carbon batteries (widely used for operating radios) has severe environmental and health risks, including pollution of the soil with toxic materials. Devergy micro-grids help address all of these issues.

Most of the company's employees are local people, who provide the technical support for the installed systems and act as a continuous interface between Devergy and the communities it serves. By providing individuals in the community with solar engineering training, Devergy aims to improve their income prospects.

Scaling Up

Devergy has mainly targeted household customers. Going forward, it plans to develop solutions to cater to the needs of businesses as well. Some of the solutions under development include refrigeration, entertainment applications (such as cinemas), and agricultural equipment (grain mills and rice huskers).

The regulatory framework in Tanzania provides a conducive ecosystem for private sector participation. A project below 100 KW, for example, does not require a government license or approval for tariffs. The government's "Rural Energy for Rural Electrification" program promotes private and NGO participation to set up renewable energy mini- and micro-grids that sell power directly to retail customers. The government has also removed value added tax and duties on solar components, such as panels, batteries, inverters, and regulators, allowing end-users to buy solar at an affordable price.

The regulatory framework in other countries may not be as supportive as in Tanzania, which could constrain the growth and replication of Devergy's model. The partnership in Ghana, for example, did not move beyond the pilot stage because of regulatory issues regarding licensing and tariffs.

A few factors constrain expansion. The working capital requirements of Devergy are high, because it finances its sales. (Other sources of financing for customers, such as microfinance, tend to go toward income-generating activities, not the purchase of household applications.) Devergy's operations are not yet profitable. It has relied largely on grants and investments by the DOEN Foundation, Persistent Energy Partners, EEP Africa, and others. Additional grants and capital are required to sustain the growth momentum and expand the user base.

Reference

World Bank. n.d. Tanzania Energy Development and Access Project (TEDAP) and SPPs. Washington, D.: World Bank https://www.esmap.org/sites/esmap.org/files/TEDAP_percent20SPPs_percent2011-18.pdf.