INCLUSIVE INNOVATIONS

Using Off-Grid Equipment for Productive Use

HIGHLIGHTS

- Renewable energy solutions, such as solar pumps, are cheaper in the long-run than traditional equipment powered by diesel.
- Companies reduce upfront costs by allowing small holders or micro-entrepreneurs to only buy the service per use and not the equipment.
- Having continuous access to irrigation improves farm productivity and allows farers to grow cash crops with higher water requirements and higher value.

Development Challenge

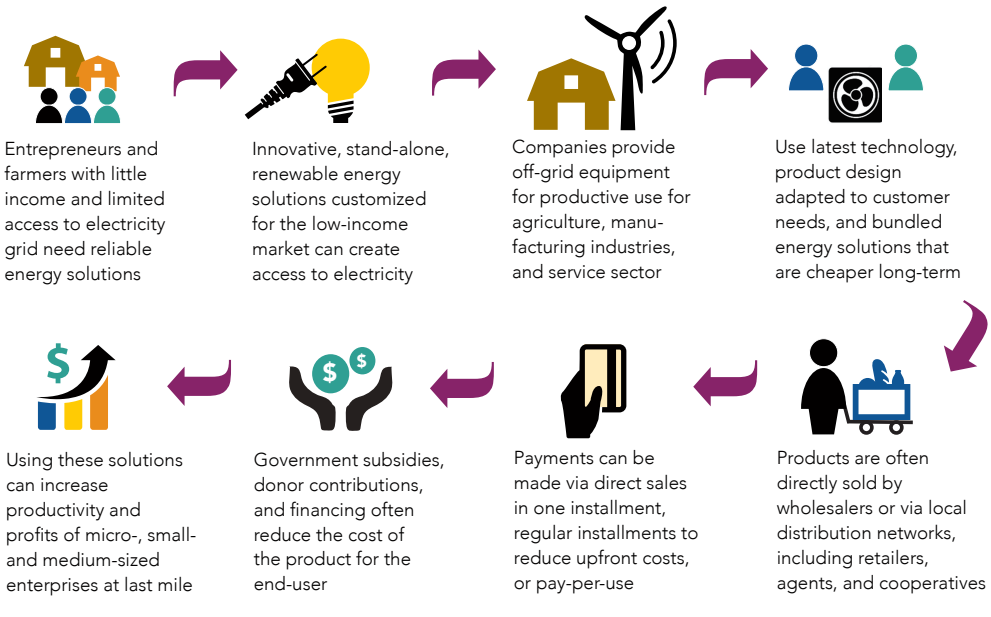
In 2013, some 1.2 billion people lacked access to electricity (IEA n.d.). Most of them lived in rural areas in Sub-Saharan Africa and South Asia. Power supply is critical to economic and human development, but utilities in many low- and middle-income countries either lack the financial capacity to expand their grids to isolated rural areas or choose not to do so because of the low return on investment. Rural consumers must therefore rely on traditional biomass, kerosene, and batteries, which are expensive and pose environmental, safety, and health risks. Moreover, these energy sources are insufficient to power machinery needed to improve agricultural productivity and value added, trapping farmers in a cycle of low agricultural productivity and income.

Business Model

Companies that provide off-grid equipment for productive use deliver advanced energy solutions for agriculture, manufacturing industries, and the service sector in areas with limited access to electricity. Productive use is defined as a direct input to the production of goods or provision of services. The target groups are (micro) entrepreneurs or farmers with some existing capital, or some income or collateral. Typical applications of energy for productive use at the BoP include:

- Heating and cooling (e.g., air conditioning, milk cooling)
- (Agro-)processing (e.g., meat and fish drying, flower)
- Water-related equipment (e.g., pumping for irrigation, pumping for drinking water)
- Communication (including Internet, telephone)
- Energy production and conversion (e.g., battery charging, phone charging)
- Manufacturing equipment (e.g., tailoring, handicraft production)

Features of the Off-Grid Equipment Business Model



Implementation: Delivering Value to the Poor

Awareness

To create demand for their products, businesses, or their partner NGOs, do demonstrations that show the economic benefits and use of the technology. This is especially important for products that the target group is not familiar with, such as solar dryers when farmers have traditionally used air drying techniques. Word-of-mouth is critical for promotion. Less frequently, local sales agents play a role in creating product awareness. Companies also speak to governments, MFIs, and commercial banks, who need to be aware of the technology and create suitable financing arrangements.

Acceptance

Off-grid equipment for productive use provide a cleaner and cheaper alternative to machinery powered by fossil fuels in the long run due to low operating costs. In addition, users do not have to rely on an unstable fuel supply. To create tailor-made applications that meet the needs of their users, companies conduct market studies, cooperate with local universities, and monitor the usage of their products. To support after-sales services, some companies, such as the pump producer Claro Energy, have started using remote monitoring tools, while other companies, such as Nishant Bioenergy, have developed a network of local partners who ensure maintenance at short notice.

Accessibility

Products are often directly sold by wholesalers or via local distribution networks, including retailers, agents, and cooperatives. For example, Proximity Designs in Myanmar sells its pumps via 800 village agents that work on a commission basis and generate more than 50 percent of the total transactions. SunDanzer distributes its fridges via dairy farmer cooperatives.

Affordability

Government subsidies and/or donor contributions often reduce the cost of the product for the end-user. To make the products affordable, companies also partner with MFIs or commercial banks to provide financing for their customers. Generally, three different sales models are used depending upon the local environment and customers' buying power. While the capital goods-oriented direct sales model requires high upfront capital outlays, payment by instalment and pay-per-use models are models especially developed for the BoP market to overcome the barrier of high upfront costs.

This focuses on companies that offer bundled solutions, which include the generation of electricity and the equipment involved. Energy is typically generated via solar panels, but also by hydro or wind power. Equipment such as pumps, cold storage, or drying systems are specially designed to work in an energy-efficient way and on low currents.

The companies offering off-grid equipment for productive use are predominantly for-profit or hybrid models that receive financial support from international donors or local governments. Most players entered the last 10 years and are still in a pilot or rollout stage.

Key cost factors are the upfront research and development costs for development of off-grid solutions, market outreach, upfront financing, and setting up distribution. Many enterprises design and manufacture their own equipment. Costs incurred on research and development, product design, and testing constitute a significant share of the overall costs for enterprises providing off-grid productivity solutions.

Results and Effectiveness

Many companies are still in pilot or initial rollout stage with a limited number of households reached. The Indian solar water pump producer Claro, for example, reaches 17,000 people with 1,200 pumps across 12 Indian states. Proximity Designs has sold 90,000 pumps reaching 450,000 people while the Centre for Rural Technology has set up improved water mills in Nepal reaching 330,000 people.

Replication of business models has not happened yet. This is also why most models are still quite localized, targeting one specific region. However, development challenges such as cold storage or irrigation needs are widespread in developing and emerging countries, and the products therefore are conducive for replication if financial viability can be achieved.

Evidence indicates that electrification can lead to the creation of new companies, which generate additional income and employment and ultimately enhance local demand. Besides, access to reliable modern energy sources increases productivity, lowers energy and production costs, and improves access to information. Continuous access to irrigation through solar water pumps, for example, not only improves farm productivity but also allows farmers to grow cash crops with higher water requirements and higher value.

WORLD BANK GROUP

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.