INCLUSIVE INNOVATIONS

Formalizing the Electricity Grid Connection

HIGHLIGHTS

- Multi-stakeholder engagement (utilities, municipal and government bodies, consumers and NGOs) is crucial to design a solution that brings in 10,000 to 300,000 new customers in urban informal settlements.
- More paying customers enhances the financial viability of the utility, reduces electricity theft and ensures better quality of services provided.
- Innovative metering technology, multiple tariff options, and mobile payments helps lower costs and match payments with users' income flows.

Development Challenge

According to the 2015 World Energy Outlook, more than 1.2 billion people live without access to electricity, which corresponds to 17 percent of world's population. The electrification gap is greatest in Sub-Saharan Africa, where 634 million people lack access to reliable electricity resources. The region's electrification rate stands at 32 percent (59 percent in urban and 17 percent in rural areas). Access to electricity is particularly important to human development, as certain basic activities—such as lighting, refrigeration, running household appliances, and operating equipment—cannot easily be powered by other forms of energy. Moreover, sustainable provision of electricity can free large amounts of time and labor and promote health and education. Barriers to urban electrification include low household incomes, low consumption levels, and inappropriate pricing and subsidy schemes. Theft and illegal connections are common in urban slums and informal settlements, where residents do not qualify to be legal utility customers.

Business Model

The business model consists of three components: (1) multi-stakeholder dialogue to increase trust and social capital among different stakeholders; (2) new connections provided (and often subsidized) by the power utilities; and (3) new technologies improving fee collection rates among the new customers.

A social compact comprised of various stakeholders, such as local residents, NGOs, and public authorities is developed to build awareness about legal connections and promote trust-based relationships and thus ensure acceptability (and sustainability) of the solutions.

Features of the Business Model

Limited Access
Rapid urbanization leads to illegal and costly electricity connections in low-income settings

Harmful Effects
Theft and poor grid infrastructure create a safety hazard and unreliable service for all

Stakeholder Engagement
Utilities and distribution companies, public authorities, consumers, and NGOs collaborate

Design for Acceptance
Companies assess local consumption and payment needs to design solutions and build trust

Awareness Creation
Information sessions and word of mouth explain legal process and its benefits

Increased Availability
Flexible new approaches help slum dwellers access electricity despite lack of land ownership

New Technology
Companies use prepaid or collective metering and remote monitoring to control demand or supply

Greater Affordability
Installation costs are reduced or financed, and flexible tariff-payment options are offered

Impact
Low-income households transform into legal customers through innovations and community outreach

Implementation: Delivering Value to the Poor

Awareness

Companies raise awareness through holding regular information sessions and distributing information materials about the process for getting a legal connection and its benefits. Such information also spreads through word of mouth. They further educate users about efficient use of electricity to help manage their household budget. Awareness raising is often conducted in partnership with NGOs and CBOs that enjoy community trust. However, for lack of such partners, the Philippine utility MERALCO facilitated establishment of "household associations"—comprising of community members—to manage payments for extension of distribution lines, and take over the responsibility for the system within the slums.

Acceptance

Utilities need to gain an understanding of the reasons for the existence of illegal connections, specific consumption patterns, payment arrears, and why some areas are not properly served. This understanding is achieved by reaching out to community leadership and other stakeholders, such as NGOs and CBOs operating within the community. Discussions with the communities and understanding of their needs leads to the creation of trust and social capital.

Accessibility

Lack of legal status of most slum dwellers is a crucial barrier to access in slums and informal settlements. Legal ownership of land is usually a prerequisite for a new electricity connection and flexible and innovative approaches are required to overcome this barrier. In the slum electrification program started by the Ahmedabad Electric Company (AEC) in India, the local municipal corporation played a facilitating role by issuing 10-year non-eviction certificates, which granted the informal settlement households legal status and security of tenure sufficient for a new connection.

Affordability

The slum residents are often viewed as non-paying and defaulting customers. On the contrary, these residents do spend a significant share of their incomes on energy, albeit toward connections from local illegal operators or alternate energy sources (kerosene, candles, or batteries). Two aspects related to making electricity affordable among the target customers are lowering and financing installation cost and flexible bill payments.

The upfront cost for a new connection, which could be prohibitive for low-income customers, is subsidized, reduced, or financed by the distribution companies. Finally, the changes are also matched by tailor-made technical approaches, such as prepaid or collective metering and remote monitoring among others, to improve fee collection, reduce operating cost, and decrease the risk of default.

Major costs associated with setting up of these models are borne by the utilities and power distribution companies. In collaboration with representatives of the civil society and NGOs, they cover the cost of setting the social contract. At times, these initiatives are supported by governments or international donors and development agencies.

Results and Effectiveness

Scale and reach. Since most of the projects are implemented by large utilities, the number of customers reached per project is usually quite high. EDM was able to increase its customer base by 130,000 households by using prepaid meters across various regions in Mozambique.

In the Philippines, more than 300,000 households were either regularized or connected to the grid for the first time by MERALCO. This was done by bringing distribution lines to the perimeter of slums from where the households were allowed to install their own wiring to reach their homes. This helped overcome issues related to "right-of-way" on land with disputed ownership, thus reaching out to a wider population in the slums.

Improved outcomes. Legal electricity connections result in reduction of accidents. In all cases where households were illegally connected by tapping electricity lines, exposed wires and improper handling posed a major fire and personal health hazards. Regularization of slum electricity connections also entails community-wide security benefits by reducing crimes through the installation of street lighting.

Cost-Effectiveness. For end-users, it is often cheaper to have a legal connection. For example, for legally connected households in Ahmedabad, consumption was about 36 kWh per month, costing around USD 3. For consumers with an illegal connection, the same level of consumption cost twice as much, around USD 5 per month because of rates charged by middlemen for an illegal connection

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This series on Inclusive Innovations explores business models that improve the lives of those living in poverty. Editors are Elaine Tinsley and Cristina Navarette Moreno. Written and researched by Endeva UG and Ashley Insight.