

# Firms push envelope with bright ideas to deliver energy to Africa

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The Bertha Centre for Social Innovation and Entrepreneurship, a specialised unit at the UCT Graduate School of Business, said in 2015 that in terms of current trends, it would take until 2080 for every African to have access to electricity.



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However, despite this rather gloomy prediction, lights are switching on across the continent thanks to the ingenuity of energy entrepreneurs and their funders. While more than 600-million people in Africa lack access to clean, safe and affordable energy, innovations in solar technology, mobile payments and distribution models are increasingly enabling greater levels of affordable access. In support of these innovations, the industry has seen committed capital of at least \$30bn over the next five years from public and private funders - all focused on Africa for access to energy. However, access to finance remains the number one restriction to scale, according to energy access enterprises.

Based on workshops and consultations with more than 100 industry representatives, the centre's report explores innovative finance solutions for the industry.

Although the majority of mainstream efforts focus on large-scale infrastructure development, much of Africa's potential lies in the off-grid space, which is being tapped by so-called energy access entrepreneurs. They leverage the current momentum behind local, decentralised, renewable energy solutions, particularly solar technologies such as microgrids, solar home systems (SHS), and intra-household or 'pico-solar' systems.

Pico-solar systems typically light a few rooms, can charge multiple phones and power a small appliance such as a radio. SHS are larger than pico-solar systems, typically power up to 10 lights and can power appliances such as refrigerators and televisions. For solar home systems and pico-solar products, Kenya, Tanzania and Ethiopia made up 66% of the sales in Africa in 2015. With a penetration of 30% of off-grid households, Kenya is the most significant market, with Rwanda and Uganda regarded as the next emerging frontiers (Scott et al. 2016).

The market opportunity has spurred innovative business models, such as M-Kopa and Off-Grid Electric, that allow people to pay-as-you-go for their solar products. Over the past five years, the pay-as-you-go model has become the popular end-user financing model. With pay-as-you-go, customers pay a small deposit for a solar system to be installed in their homes. They then make smaller regular payments over time, usually through a mobile payment system, to pay for either the energy used or ownership of the system.

Beyond pay-as-you-go models, other companies are thinking creatively about the consumer financing component by tapping into either state resources or collaborating with corporates. The iShack project in SA builds their model to be in sync with national energy access strategies and integrates the mandated free basic electricity subsidy into their end users' payment model.

Solarus, an international renewable energy technology, is testing another interesting business model in SA. To extend their off-grid energy solution to lower-income customers who may not be able to afford the installation cost, Solarus is collaborating with a hotel in SA to roll out the Hotel Staff MPower Project.

The hotel will finance the upfront installation costs of the systems to up to 600 employees' homes. The employees repay the cost of the installation at an affordable monthly rate to the hotel.

## Energy provision

As off-grid energy provision is an emerging industry operating in a challenging environment, the industry roadblocks and bottlenecks go beyond access to finance. These challenges are often referred to as the Three As: Affordability, Access and Awareness.

**Affordability:** Even with end-user financing innovations, the upfront costs of energy products and services such as solar home systems, improved cook stoves and even solar lanterns remain beyond the means of the majority of end-users. One distributor in Uganda highlighted that only 30% of the rural population can afford their services.

**Access:** Providing access to energy in areas with limited infrastructure makes distribution a key challenge. The absence of adequate supply chains, long travel distances, and poor transportation and communications infrastructure in rural areas add to the cost of doing business.

**Awareness:** Distribution and infrastructure cannot stand alone. Energy providers also need to create awareness of the benefits and the business model, often supported by NGOs and similar intermediaries. This should especially focus on the uptake of products from customers, which has been hindered by low-quality products in the past, and limited understanding of the potential.

## Committed capital

As said before, the industry has seen combined committed capital of at least \$30bn over the next five years from public and private funders - all focused on Africa for access to energy. However, access to finance remains the number one restriction to scale, according to energy access enterprises.

The UN's Sustainable Energy for All (SE4All) initiative, which works towards universal energy access by 2030, estimates that annual investments of \$48bn are required to reach universal access.

USAID's Power Africa initiative has identified more than 43 private sector investors and practitioners who have committed \$1bn to emerging energy access enterprises over the next five years through the Beyond the Grid initiative.

Traditional financing through commercial banks or commercial lending institutions has not been a viable option for many of the energy access enterprises. The inability to predict future cash flow from sales, the actual return on investment per product sold, the lack of customers' credit history and, often, the informal economy within which these businesses operate mean they struggle to access finance.

Enterprises and entrepreneurs highlighted that:

- 1) there is an increasing need for local capital for (local) entrepreneurs,
- 2) seed funding remains a challenge,
- 3) working capital is one of the most significant financing gaps, particularly for enterprises offering pay-as-you-go solutions to their customers, and
- 4) funding for logistics and distribution often goes ignored.

## Concept grants

Recommendations for different capital providers include:

**Grant providers:** In order to scale, the industry will need continued grant funding and concessionary capital along with better integration into the investment cycle. This concessionary capital will likely be necessary for proof of concept for early-stage ventures.

One of the most impactful proof of concept grants in the industry is USAID's Development Innovation Ventures, which funds enterprises from innovation to scale.

Apart from directly seeding early-stage ventures, grant capital can be catalytic in opening up new, untested markets for the larger energy access companies, thereby enabling them to expand faster than otherwise possible. An impactful example is the use of result-based finance in Tanzania, where companies are incentivised to go into harder-to-reach, high impact areas.

Local banks and other financial services providers: for companies that rely on cash sales and provision of devices to end customers on a pay-as-you-go basis, working capital is a critical component to operating and scaling a business. Local banks remain relatively hesitant to lending based on cash flows, especially to early-stage companies in a sector most banks are not familiar with.

One emerging alternative comes from digital finance, such as online lending marketplaces, which can be supported by international impact investors, local institutional investors as well as retail investors.

Through an online marketplace, the transaction cost of small and medium enterprises investing is reduced and automated. One such platform, which is blending institutional and retail investments, is Rainfin, launched in 2012 as SA's first online lending marketplace.

**Impact investors:** Not surprisingly, investors generally did not second the notion that access to finance is the key challenge. For impact investors targeting market-rate return, the key challenge reported is a lack of investable deals. To mitigate this, impact investors are working with energy access enterprises to test new models such as securitising pay-as-you-go portfolios through bond structures. This is being explored by BBOX, a London-based solar innovator, which sells solar systems on a monthly plan, thus replicating the US solar bond model of securitisation for Africa's off-grid solar

market.

The company aims to raise \$2bn over the next five years to turn solar into an asset class and create contracts for thousands of solar rooftop arrays to sell as bonds to investors - ultimately demonstrating that it is possible to lend on the basis of future receivables from the solar home system contracts and the securitisation of the unbanked.

Thanks to the ingenuity of energy access entrepreneurs, such as M-Kopa, BBOXX, Solarus, and iShack, as well as the funders they partner with, the future is increasingly looking bright across the continent as millions of people are accessing off-grid energy.

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