

# The DRC – the best pay-go solar market in the world?

The sprawling cities of the Democratic Republic of Congo (DRC) are hardly the first thing to spring to mind when someone mentions pay-as-you-go solar. The heartlands of this industry are the rural areas of relatively stable African countries, like Kenya, Rwanda and Tanzania. Indeed, mention DRC at all and the first response tends to be about war, violence or corruption.

So it is understandable that the major pay-go solar players haven't exactly been falling over themselves to enter the market. There are safer and easier markets.

This is a huge missed opportunity. DRC has an electrification rate of just 8%, a large US-dollar powered commodity economy and key enablers, such as mobile money, in place. It has big, urban economic hubs with chronic power problems. This translates into much higher average revenues per user (ARPU) and the chance to build a sustainable solar company in a much faster time period than usual.

In fact, we believe that DRC is possibly the best pay-go solar market in the world - if you know what you are doing.

### The best pay-go solar market in the world

The troubled history of Congo has created a unique situation: a large urban population with no power.

Although most of rural sub-Saharan Africa is lacking in energy, it is unique to find large cities that are simply not connected to the grid. In a country of 80 million people the state utility, Société Nationale d'Electricité (SNEL), has just 500,000 registered connections.

And even those lucky enough to be connected are usually in the dark. Despite its potential, Congo's energy infrastructure is crumbling. Grid outages of more than 75% of the time are

the norm. Last year, Kisangani, a city of 1.6 million people, was without power for months when the city's hydroelectric dam broke down. Butembo, a city of 0.7 million people, hasn't had a functioning grid since independence.

As a result, a whole ecosystem of alternatives has sprung up: shared generators set up by local entrepreneurs, battery powered torches and low quality open-market component-based solar panels. These alternatives tend to be expensive, poor quality and even dangerous. It is not uncommon for wild voltage swings from cheap generators to destroy appliances and start fires. Someone once explained to me that he stopped using a shared generator after testing the output of his sockets and finding that it was 800V (!) – easily enough to kill any of his children if they were curious enough to put their fingers in the socket.

**Despite all of this, to date, no pay-as-you-go solar provider has emerged as a serious player. That makes the DRC the biggest off-grid market in the world that is yet to have a major solar company at work.**

**FIGURE 1**  
DRC is the biggest off-grid market in the world without a major pay-as-you-go solar company at work (Source: World Energy Outlook 2014 – Electricity Access Database)

RANK	MARKET	OFF-GRID POPULATION (MILLION)	MAJOR PAY-GO PLAYERS PRESENT
01	India	244	Simpa Networks
02	Nigeria	98	PAS BBOXX, Lumos, GLP
03	Ethiopia	73	Azuri, Mobisol, SunTransfer Tech
04	<b>DRC</b>	<b>62</b>	<b>BBOXX</b>
05	Bangladesh	60	IDCOL
06	Pakistan	51	Eco-Energy Finance (BBOXX partner), Nizam Bijli
07	Indonesia	41	No major off-grid solar companies in operation as yet
08	Tanzania	36	Mobisol, Off-Grid Electric, Azuri, GLP
09	Myanmar	36	SolarHome, GLP
10	Kenya	36	BBOXX, M-Kopa, Mobisol + others



It was within this context that the Shell Foundation, DFID, USAID and Power Africa made the decision to support BBOXX in running a pilot in Goma, Eastern DRC. With a population of 1 million, Goma has an estimated total power need of 80MW. The state utility supplies just 3-5MW (and as a friend once put it to me, 'even that is with difficulty'), meaning BBOXX's products were well received.

The findings of the pilot were remarkable. With over 500 subscribers to date, average revenues per user (ARPU) from BBOXX customers in Goma are ~4x greater than the average off-grid solar customer in East Africa. This is due to several factors: i) higher ARPU product mix (the vast majority of systems sold included TVs), ii) introduction of a new larger product range to target a higher income market segment that exists in DRC, and iii) higher prices to offset the risk of the market and higher operating costs. The traditional pay-go solar customer is a subsistence farmer, earning ~\$50 per month. The typical BBOXX customer in Goma has comparable living conditions and faces similar energy challenges but typically earns ~\$150 per month – the cost of living is much higher. Moreover, a base of wealthier customers, also lacking power and with higher energy needs, allows for margin subsidization across market segments. Simply put, the social impact of distributing solar systems in urban DRC is equivalent to pay-go solar's rural heartlands, but there is potential to build a sustainable business much faster.

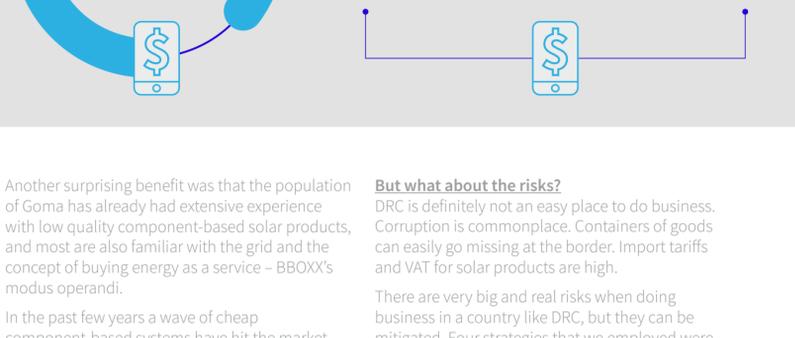
**Market fundamentals are there**  
We anticipated having to make significant changes to our business model when expanding to DRC. The two key concerns BBOXX had before starting operations were i) poor portfolio performance due to theft and tampering, and ii) lack of mobile money penetration. We discussed implementing more detailed credit checks and potentially finding ways to accept cash.

However, both concerns turned out to be unfounded. The portfolio performance, although early days, has so far been comparable to that of customers in Rwanda and Kenya – most Congolese are happy to pay for a service that is properly explained and our fears of tampering were overblown.

**On the mobile money side, 85% of BBOXX's customers had a mobile money account before signing up for BBOXX and there is a healthy density of mobile money agents in the city.**

Other market fundamentals are also in place – good mobile connectivity and high mobile phone penetration. Furthermore, the concentration of customers in a small area leads to some efficiencies in terms of servicing customers. In the end we made very limited changes to the fundamental BBOXX business model.

**FIGURE 2**  
85% of BBOXX customers had mobile money before signing up to BBOXX (Source: BBOXX Customer Survey n=100)



Another surprising benefit was that the population of Goma has already had extensive experience with low quality component-based solar products, and most are also familiar with the grid and the concept of buying energy as a service – BBOXX's modus operandi.

In the past few years a wave of cheap component-based systems have hit the market and the roofs of DRC are now littered with broken solar systems. Customers have learned to distinguish between high and low quality panels and also understand the 'myth of ownership' – they no longer have illusions of eternal free power after a one off purchase of a solar system and understand that there is little point in owning a broken system. They now want quality products and are open to the idea a service model (i.e. paying for solar energy as a service rather than buying an asset).

**But what about the risks?**  
DRC is definitely not an easy place to do business. Corruption is commonplace. Containers of goods can easily go missing at the border. Import tariffs and VAT for solar products are high.

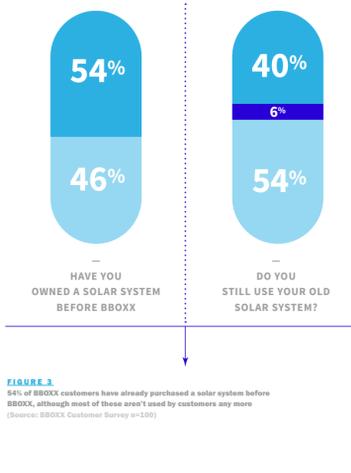
There are very big and real risks when doing business in a country like DRC, but they can be mitigated. Four strategies that we employed were 1 following the right playbook, 2 finding the right local partners, 3 hiring top quality local staff and 4 cutting edge technology.

## 1 Following the right playbook

BBOXX has significant organizational experience from expanding to and operating in difficult markets. Over its eight-year history it has worked with partners in tricky markets such as Pakistan, Sierra Leone, Togo and Angola. All of this has helped to develop a 'playbook', of do's and don'ts, checklists and recommendations.

Part of this is formal: BBOXX has a 'Launchpad' training programme for all new markets which involves bringing senior managers of the new company to Kigali for two weeks to learn from BBOXX's veteran managers and to see a fully-fledged solar company in action. There are also regular knowledge sharing sessions with counterparts across the business, such as between marketing and sales teams worldwide.

The other part of this is informal. Within the organization there are people that have been working in this industry across the world for many years, and have already faced most of the problems a new team will face. This 'organizational memory' helps to avoid repeating mistakes and to make the right decisions for the business in new and challenging markets.



**FIGURE 3**  
54% of BBOXX customers have already purchased a solar system before BBOXX, although most of these aren't used by customers any more (Source: BBOXX Customer Survey n=100)

## 2 Finding the right local partners

Local partners are invaluable to help bring clarity to doing business in the DRC. Even simple business processes, such as company registration, can be opaque and risky without someone with local knowledge that can guide you. BBOXX is fortunate in that it has a long history in the Congo – it originally started operating there seven years ago and the company has continued to maintain relationships with partners made during that time. BBOXX partnered with two local partners to help get its operations established in Goma.

The first was Altech, a local solar lantern distributor that has distributed over 100,000 lanterns across Congo. One of the Altech co-founders joined BBOXX temporarily to run the pilot and help establish the company. This partnership brought valuable operating knowledge as the business was launching in the areas of HR, logistics and customer insights.

The second partner was GoShop, the biggest distributor of large solar systems in Congo. The owner of GoShop had previously set-up and run a BBOXX franchise in Uganda five years previously so understood the BBOXX business well. They became BBOXX's technical partner to manage import, warehousing and repairs. These are some of the highest risk processes in a country such as the DRC – due to risk of stock loss and bribery or corruption. Outsourcing these processes reduced the risk faced by the business at an early stage when it was most vulnerable and enabled the company to focus on its core priorities - building the right team and determining the right product, price and payment model.

The challenge with any partnership, but especially in a market like DRC, is to find a partner that you can trust. By working with trusted partners with which relationships had been built over multiple years, BBOXX was able to smooth its entry into Congo.

## 3 Hiring top quality local staff

Like local partners, hiring the right local team makes a huge difference in ensuring success of a new company in a country like DRC. BBOXX was lucky enough to attract some of the best local talent with the right combination of skills, experience and social capital. We firmly believe that a strong local management team, that knows the country had has the right connections, is one of the secrets to the success of our initial pilot.

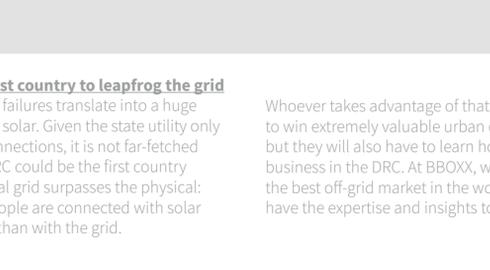
## 4 Cutting edge technology

Cutting edge technology enables BBOXX to minimize its costs and risks. BBOXX systems are GSM-connected, enabling them to be switched on and off remotely and for system usage data to be collected and monitored. This data can be used to proactively service customers and ensure that their systems are always working well. For example, if a customer tampers with their device, or plugs in non-BBOXX accessories, we can send them a warning SMS or trigger a visit from a technician. This data can also be used to proactively manage the client relationship – with machine learning algorithms pulling a vast array of customer data (energy consumption, payment history, call logs etc) we can predict when a customer will face financial difficulties before they may even know themselves, and intervene appropriately, such as offering them a product downgrade. All of this helps minimize and reduce the risk of customer credit risk and tampering, and build a scalable resilient business even in difficult market conditions.

### The next steps for BBOXX are to scale-up

We just signed a contract with the DRC Government to collaborate to electrify 2.5 million people by 2020 as part of a project called 'Energie pour Tous'. By the end of the year we will expand across Eastern Congo and Kinshasa and next year we will set up operations across the country. By introducing a smaller system, we also intend to continue to move down the pyramid and to target lower income consumers.

The challenge is funding. As with everywhere else in the world, this business is capital intensive and significant funding is required. The number of investors willing to put their money into DRC today is small (especially for equity). Part of this is due to the real risk of doing business DRC, part is the perceived risk. The development sector can help investors make their first steps into this unknown land and unlock the market. Shell's initial grant funding, for example, enabled BBOXX to persuade its board to take the risk to expand to DRC. Meanwhile, ELAN RDC, funded by the UK Department for International Development, offers a results-based financing scheme for each low-income household electrified in DRC. Schemes like these, and others (equity co-ownership grants, debt guarantees) can help investors to start to think about putting their cash into a market that was otherwise far down their list, if on their list at all. The pay-go solar market in DRC is a huge opportunity, ready to take off, but it will still need some help to get started.



**Congo - the first country to leapfrog the grid**  
Congo's energy failures translate into a huge opportunity for solar. Given the state utility only has 500,000 connections, it is not far-fetched to think that DRC could be the first country where the virtual grid surpasses the physical: where more people are connected with solar home systems than with the grid.

Whoever takes advantage of that opportunity stands to win extremely valuable urban energy consumers, but they will also have to learn how to handle doing business in the DRC. At BBOXX, we think that DRC is the best off-grid market in the world – but only if you have the expertise and insights to make it work.

### BBOXX Company Overview

BBOXX is a next generation utility. It powers growth and transforms lives with solar systems that provide the on-grid experience in an off-grid setting across the developing world.

Company founded	2010
Portfolio size	150,000 systems
Markets with BBOXX products	35 countries
Vision	To deliver reliable electricity to 20 million people by 2020.
Business model	Fully vertically integrated. Own the design, manufacturing and distribution networks.