
# MOBILE FOR DEVELOPMENT IMPACT

## OFF GRID ELECTRIC – BRIGHT, MODERN LIGHTING AND ELECTRICAL SERVICES, AFFORDABLE TO EVERYONE

Finn Richardson - February 2015


GSMA Mobile for Development Impact supports the digital empowerment of people in emerging markets through its Mobile for Development resource. It is a central platform of data, analysis and insight used to inform investment and design decisions for mobile services.

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# Case Study – Off Grid Electric

## Bright, modern lighting and electrical services, affordable to everyone

### Product summary

Off Grid Electric is the world's first radically scalable solar leasing company aimed towards the world's 1.6 billion unelectrified households. Off Grid Electric delivers innovative stand-alone solar systems to a range of last-mile customers at costs lower than traditional kerosene lighting. It does this by taking advantage of breakthroughs in mobile technology, and building from the ground up to incorporate all aspects of product design, distribution, sales, financing and service. Off Grid Electric systems are designed to produce affordable, high quality energy for generations to come. Through partnerships with telecom companies, customers are able to make payments conveniently through their phones.

**Year Launched:** 2012

**Business Model:** Consumer-led

**Targeted Device:** Basic phone (all mobile money enabled devices)

**Primary Delivery Technology:** SMS, USSD

**Products & Services:** Home off-grid solar solutions for lighting, radio and mobile phone charging

**Markets Deployed In:** Tanzania

**Estimated Total Number of Users:** 30,000

### Background

Off Grid Electric co-founder and CEO F. Xavier Helgesen began assessing the market and incubating the concept for Off Grid Electric while studying as a Skoll Scholar on the Oxford MBA programme, having already successfully launched his first venture Better World Books. It was here that Xavier met and began working with Erica Mackey, co-founder and COO of Off Grid Electric. Originally Xavier and Erica began by looking closely at 'community power for mobile' projects for powering mobile masts while providing power to the local communities around them, and began to assess what kind of business potential this sector held. Off Grid Electric conducted fieldwork in Bangladesh and Rwanda in partnership with GSMA. Based on this fieldwork, it concluded that the proposed community power model had the strongest potential in East Africa. Unlike East Asia, there are no kerosene subsidies in East Africa with which to compete, meaning greater potential for energy services to be less costly to the end user than existing alternatives.

The team moved to Tanzania and found the potential for solar home systems in the area greatly exceeded what had been observed five years earlier. The team was also struck by the patterns of adoption in the market for these systems, where the main factor involved price and financing curves. Most importantly, however, they discovered that risk was the primary inhibitor to solar sales. Customers were afraid to invest in expensive equipment that might fail. There is a lot of risk involved with investing in a USD$100 to USD$1,000 solar home system, especially considering that existing systems tended to have an operational life-expectancy of only 1-2 years. In response to these observations, Off Grid Electric (OGE) was established to provide better solutions in terms of technology and delivery.

## Objective

Off Grid Electric aims to make modern energy accessible and affordable by using innovative payment systems and ensuring a strong focus on service and distribution. The Off Grid ethos is that for a product or service to be truly mass marketable then it has to save users money every day while also being better than competitors in practical terms.

## Results

Off Grid Electric now has 30,000 customers in the northern zone of Tanzania and is beginning expansion into other nearby regions.

## Impact

Off Grid Electric claims to deliver the most durable and affordable solar home systems within the East African market. Off Grid Electric customers enjoy brighter light quality than they did with kerosene, at a lower cost. Furthermore, there are health and safety benefits associated with no longer being in close proximity to kerosene liquid, flames and fumes. Off Grid's systems also charge phones and power radios. In 2015, Off Grid will introduce an affordable solar home system with television.

## Lessons learned

1. **Highlight mutual benefits to MNOs -** It is important to make sure that the economics of a service are attractive to MNOs who will partner in the delivery of a service. For example, MNOs offering mobile money services can provide adjusted rates that can really benefit the economics of an M4D service, particularly when dealing with customers frequently paying small amounts. In return, services built on mobile money offerings will drive mobile money usage and adoption.
2. **If the market is competitive, innovate -** Even in markets where kerosene subsidies significantly reduce end user-spend on energy, large scale solar adoption can still happen with the right frameworks.
3. **Know your customers –** Off Grid Electric has observed that among its customer base there appears to be little fundamental difference in lifestyle choices and aspirations. It asserts that the primary differentiating factor that it has observed for how fully an individual can achieve these comes down to individual economics; therefore, it is important to have a range of price points and offerings available.

4. **"Your success is proportional to the number of customers homes you go and sit in. It's probably one of the best ways you can spend your time."** Surveys do have their value, but the most interesting things come out of the unexpected areas of enquiry that would not typically be thought of and included in a survey.

## Approach

Off Grid Electric started by experimenting with existing solar models and tried as many as possible prior to its design phase. It eventually formed a technical partnership with a German solar engineering company called Fosera, whose philosophy prioritizes durability and longevity in their products. Off Grid also custom designed their own customer relationship management system (CRM) with a mobile enabled software platform that tracks customer's payment history, demographic information, and exact GPS coordinators. Off Grid Electric's primary principle is in delivering the best possible service for its customers in terms of design, build, distribution and monitoring - rather than the cheapest hardware production or the biggest profit margins – while still ensuring the service is more affordable than existing alternatives such as kerosene.

## User-centric attitudes

OGE is continuing to roll out a more broad range of applications in response to customer feedback. The company is vertically integrated in that it does not outsource any part of its operations and internally manages and delivers every aspect of its service. This means that it has hundreds to thousands of touch points per day with its customers throughout the company. OGE has an ongoing mandate to get out and see what is going on in customer's homes, so many of these points of connection are through home visits to fix problems. They also receive calls to the call center or messages to the SMS line for help with queries and for resolving issues. OGE asserts that pre-designed surveys do have their value, but the most interesting things come out of the unexpected areas that would not typically be thought of and included in a survey. While individual concerns have to be dealt with one-on-one, the nature of each issue is aggregated to identify themes that are causing people trouble, and to respond to this by improving the design of the service overall.

One of the things that has been particularly interesting to OGE is the huge variety of lifestyles and livelihoods among its customers. There is an income bell-curve in the communities that OGE serves, which ensures there will be no 'one-size-fits-all' approach. OGE therefore seeks to have prices and offerings suited to these different types of customers. Customers pay a small $6 fee for installation of a self-sustaining solar system including solar panels, lithium batteries, super-efficient lights, and a meter. In order to use the energy produced and collected by the system, the customer sends Off Grid Electric a mobile payment and in return receives a passcode they can enter into the meter to unlock their energy. For about $5 to $10 a month, around equal or less than they pay for kerosene Off Grid Electric customers get a much greater power and duration of light, and the ability to charge their phone or power a television. By letting families pay for a solar system over time using micropayments that are similar to a utility bill, Off Grid enables customers to access technology they might otherwise be unlikely to afford. Off Grid Electric typically expects to see a full return on its initial investment for each unit within approximately 10 years.

One of Off Grid Electric's most popular products is its range of security lights. Initially they expected customers to put the lights inside their houses, but instead they would always prioritize a light at the front of the door to light up the courtyard. Customers report that they do this for security purposes: to ward off animals and potential criminals. In turn, these security lights have become an incredibly valuable marketing tool for OGE because they are highly visible to other potential customers.

### The use and value of data

The team also focused strongly on the software side of the project, and designed a software platform for managing the customer base, the sales network and customer usage profiles. Having a bespoke design for the capturing and managing information about customer usage and performance of the sales network puts OGE in a strong position to utilize this data to optimize their operations and performance. The process of managing this data and generating insights out of it is by no means trivial; one of the biggest challenges for OGE and many businesses is identifying the most important things to aim to get out of data, and therefore where to begin looking for them. For OGE specifically, it is critical that it meets its customer service expectations, so being able to track this, and to know who its customers are is paramount to the delivery of the service.

## Success and scalability

OGE defines scale as nationwide and regional accessibility of the service. Aside from this, OGE's operations think of success primarily in terms of market share. To date, the solar market has typically considered absolute numbers of sales or customers. As OGE see things, to become a mainstream choice for user adoption requires focus on market share - in other words there is no reason why solar should not be the dominant way that off-grid communities in East Africa get basic energy services. Presently OGE has over 30,000 customers, which is still very small from a national market perspective, but it has targeted specific geographic regions in which to introduce the service first. This is critical to developing the mechanics of the whole system correctly prior to rolling it out more widely. Within its communities of focus, Off Grid Electric has achieved a market share of over 30%. Early target markets are in the northern zone of Tanzania, but OGE operations are now beginning to expand into the neighboring 'lake zone' of northern Tanzania surrounding Lake Victoria. Finally, as a result of early operations, OGE has now set a good mass-market price point for its service. This must be established early in order to drive adoption and scalability, which ultimately decreases costs throughout the system.

## Partnerships

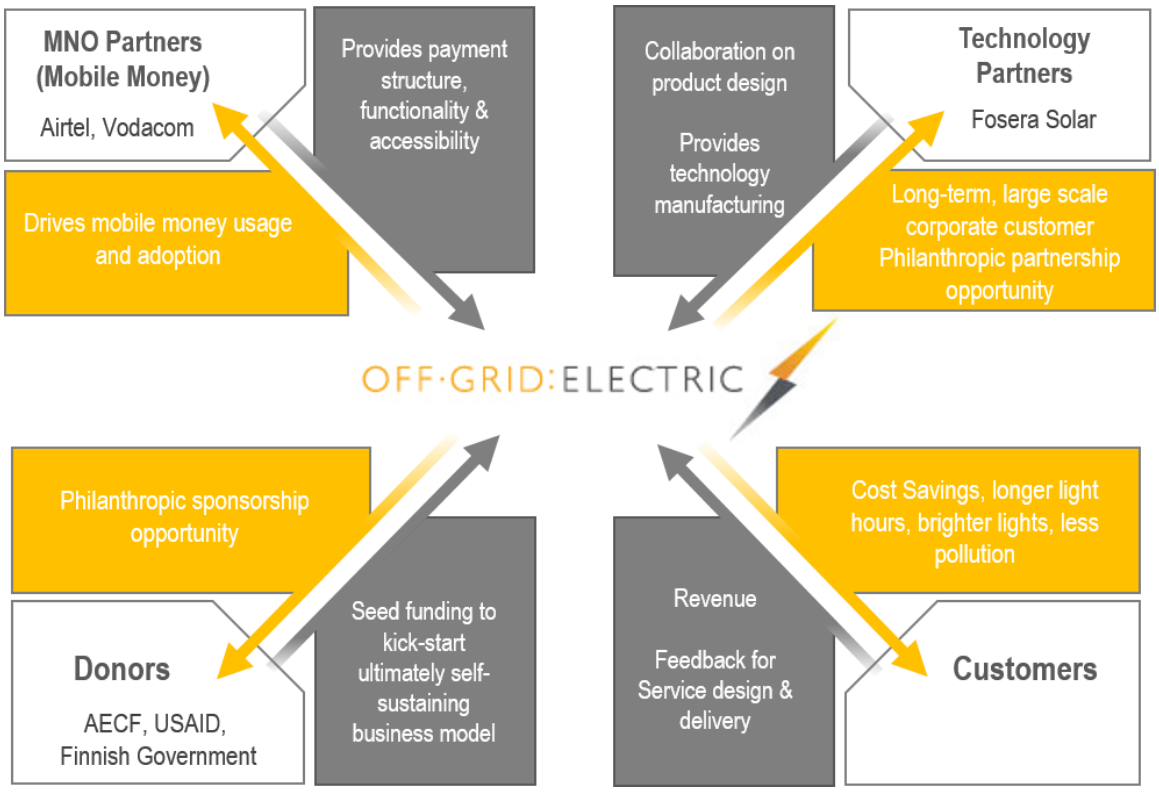
OGE initially partnered with Vodacom Tanzania in using its mobile money platform M-PESA to enable customer payments for OGE services. In addition to this, OGE is currently integrating with Airtel Tanzania to make use of its mobile money offering. This partnership also serves the mobile network operators by incentivizing and driving adoption of mobile money. Indeed, Vodacom Tanzania worked with OGE to build a pricing system for the M-PESA enabled payment platform. OGE sees the importance of making a service economically attractive to MNOs. There are certain things MNOs can put in their rates - such as minimum charges for businesses - that affect the economics of the service when dealing

with customers frequently paying small amounts. When essential services are only accessible via mobile money then this drives large scale adoption of mobile money services. OGE claims it has driven many people in the communities it serves to use mobile money for the first time. Interestingly, OGE demonstrated adoption of the service in this way before requesting assistance on building a price rating structure with MNOs. This process from initial roll-out to getting the first MNO adjusted rates on board took around nine months. Mobile money providers ideally need to have teams or individuals directly supporting companies building in this way using the mobile money platform. However, it is sometimes not easy to figure out who these people are or to get in touch with them.

In terms of financial partners, Off Grid recently raised $16 million in equity from investors like SolarCity, the largest solar provider in the US, and Vulcan Capital, the investment firm of Microsoft Co-Founder, Paul Allen. Off Grid also closed a $7 million debt facility with the IFC. OGE has received donor support from USAID, the Finnish Government, and from the Africa Enterprise Challenge Fund, all of which have been critical in getting the service up to speed.

OGE is approached almost every week by somebody wanting to use its platform or take it to another market. At the moment OGE does not engage with these kinds of requests because their present focus is not yet on full expansion but still on developing of the ideal service model. However, the company does see value in partners within new markets that understand and operate in the local context. For example, OGE is currently talking with a large conservation organization that runs programmes for about 140,000 people who live on the borders of a game reserve. One of their goals is to have people adopt more sustainable fuel solutions. This could provide the perfect opportunity to launch OGE services in the area, which would build on the existing connections and logistical practicalities that the conservation organization already has in the area.

## Partnership map for Off Grid Electric




Arrows represent direction of value add

## Challenges

There were many challenges along the way for OGE, especially since it internally integrates everything from its own engineering all the way down to distribution, maintenance and management of the operation. Choosing to build the whole network internally means that OGE probably has more ground staff than many other solar companies. In other areas, OGE has experienced challenges with mobile phone reception as a barrier to adoption; they cannot ask customers to pay via Vodacom's M-PESA if there is no Vodacom mast nearby. OGE has seen whole communities using Airtel's mobile money solution when this is the case, and vice versa, and is seeking to enable payment via more mobile money providers in order to overcome this particular challenge.

## Future plans

In the next six months OGE is looking to access larger-scale financing systems for its customer households to ensure accessibility. Any new utilities distribution system requires first to educate lenders on the economic characteristics of the system in order to get them on board to lend against new and different types of assets. In terms of geographic expansion every country in East Africa is an interesting potential market for OGE, and the service intends to expand beyond its current delivery regions in Tanzania as soon as it has the human and financial capacity. Broadly speaking, OGE would be willing to partner for delivering their services to Asia since many people want to bring the OGE approach to those

markets. The early fieldwork that OGE conducted in Bangladesh suggested that even with significant kerosene subsidies in place, large scale solar adoption can still happen with the right frameworks. In many of the East Asian markets, kerosene subsidies are a political necessity because they so directly affect the lives of the poor. However, there is potential to present alternatives where, for example, energy vouchers can be distributed in place of subsidizing kerosene prices, and people can use those vouchers for kerosene if they want or they can put them towards solar instead. This kind of framework would level the playing field in order to make solar competitive in such markets. Since none of these governments want to have to pay for kerosene subsidies, as better options become available the solar industry will potentially gain the leverage required to ask governments to step back and let solar fill the market. Off Grid Electric will undoubtedly seek to be at the forefront of such innovative changes in the future.