

The Energy Kiosk Model

Current Challenges and Future Strategies



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About the “Endeva Business Model Library”

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Endeva has been engaged in several energy kiosk projects over the last years. We have carried out market research on site, supported the setup of new energy kiosk companies, and consulted established projects. We believe in the opportunities of this model, but also see the challenges very clearly. Thus, we have decided to collect all experiences, learning points and best practices to show winning strategies for the existing kiosks and to guide organisations that are planning to set up kiosk projects. There are a couple of mistakes that have been made by others, but there are also ideas pointing to a profitable future. We would like to map out that road for you!

The Authors

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Claudia Knobloch is one of the directors of Endeva and an expert in applying knowledge of inclusive business models in collaboration with companies. She has managed more than 25 inclusive business projects and has co-authored 10 publications, including the “Inclusive Business Guide” and “Energize the BoP.” Claudia collected experience with energy kiosk projects when conducting a screening study on sub-Saharan African energy markets for Solarkiosk GmbH, and when helping to set up HERi Madagascar, an energy kiosk business active in rural Madagascar.

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Judith Hartl studied Sustainable Energy Systems in an international Master programme. She participated in the technical design of an energy kiosk solution at the Technical University of Stockholm, and supported business planning and market research for a Swedish start-up planning to commercialise the idea. In a two-month market research in Kenya, she gained an overview of the currently operating kiosk projects and their challenges. Back to Germany, she decided to investigate further in the future of this approach, and write her Master thesis on the business model of energy kiosks in cooperation with Endeva.

// **Picture on title page:**
In the Malagasy village Ampizarantany, the kiosk operator Mrs. Lanto Razananoro rents out batteries to her customers.

Photo: Claudia Knobloch

Executive Summary

03

The energy kiosk model is an approach to provide electricity to low income households in off-grid regions. The kiosk produces electricity, usually using a solar panel, and sells it to users through charging devices. A variety of actors – including multi-national companies, start-ups, governmental initiatives, and non-governmental organisations – are engaged in energy kiosk initiatives. Kiosk models can be simple charging stations for lamps and batteries, or multi-service stations offering retail products, entertainment and education. You can find successful showcases especially in Sub-Saharan Africa and India, though only few projects have gone beyond the pilot stage. Although the model works in principle, it seems difficult to create, scale, and replicate projects that have a positive social impact and are economically viable in the long term.

This issue of Endeva's Business Model Library series analyses the current status and future development of the energy kiosk approach. We focus on the design and implementation of the business model, and particularly its economic viability and interaction with local partners. Overall, we could identify 23 energy kiosk companies operating mainly in East Africa and India. Most of these projects have less than 25 kiosks up and running – they are still prototyping or just entered the replication stage. In interviews, the managers of these kiosk projects shared their point of view on the performance of energy kiosk initiatives, their key challenges and successful practices.

These challenges are linked to the customer interface – marketing and sales strategies, delivery and payment options, and customer service – as well as to the provision of necessary resources such as market information, local employees, and financial resources. Many energy kiosk companies came up with smart strategies to handle the customer interface and acquire the necessary resources. Many best practices were successfully tested in the last years, and yet there is the need for more development:

Due to their current struggles to reach financial sustainability, many energy kiosk companies carry their projects in directions diverging from the original energy kiosk approach focused on charging of devices. The new kiosks are either sold as package products in business-to-business projects, extended to retail hubs or downsized to micro-charging stations. We gathered first insights into these new strategies from the kiosk pioneers and from similar approaches in other sectors.

By collecting, analysing and presenting all these insights, experiences and opinions, we hope to contribute to the knowledge exchange between energy kiosk initiatives and their stakeholders in order to support their joint efforts in electrification!

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Introduction

05



Photo: HERi Madagascar

A short two years ago, public life in the village of Avaratsena in Madagascar ended with sunset. The over 5000 people in the village had no access to electricity, and had therefore to rely on kerosene lamps and candles to dimly light their homes in the evenings.

Since HERi opened an energy kiosk in the village in 2012, things changed: There, people can rent lamps, which illuminates their houses brightly, and cost just as much as the candles did. Evening hours can now be used for reading and sewing, and the children can do their homework.

What has also changed is that the villagers of Avaratsena no longer need to walk several kilometres in order to charge their mobile phones in the next village. At the kiosk, they can watch television, and can enjoy a chilled beer after work from time to time.

What is an energy kiosk?

Energy kiosks are central stations for electricity production and provision to consumers, usually in remote rural areas far off the central grid. In most cases, electricity is produced by solar panels, sometimes complemented by a diesel generator for backup. The electricity reaches consumers through devices with a battery that are charged at the energy kiosk. These devices could be mobile phones, lanterns of different sizes, car batteries or specifically designed battery boxes to plug in razors or radios at home. Most energy kiosks reach less than 100 households with their charging services. A common approach for energy kiosk businesses is the offer of other energy-based services in addition to charging, for example printing and copying services or screenings of football matches.

Introduction

In the scope of this research, we only analysed projects that comprise several energy kiosks with a centralised management structure. Small charging stations run by an individual shop owner exist in many villages in off-grid areas, but these initiatives stay local and are not replicated on larger scale. The projects of interest in this Business Model Library issue are multiplying the system on different sites and at scaling up the model to achieve overall profitability.

What is our mission?

Energy kiosks are one solution for electrification of remote rural households, and contribute to closing the energy access gap that exists for 1.3 billion underserved people worldwide. However, almost all energy kiosk companies struggle with scaling up and replicating their projects. At the same time, energy kiosk practitioners point out the advantages of the model: It requires low investment on the customer side and strongly involves local operators. So far, no detailed research on the status quo, concrete problems and existent solution strategies of kiosk projects has been carried out. This paper intends to fill this gap. We want to give you an overview of the existing energy kiosk companies, their challenges and best practices, and provide you some clues on possible future developments of the model.

Structure of the paper

All existing energy kiosk companies face surprising similar obstacles in setup and operation. The first chapter on the state of energy kiosks gives you an overview of the existing kiosk projects. In the following two chapters, we take a closer look at the challenges those energy kiosk companies face, and how they overcome them. We clustered the identified difficulties and tested strategies in sub-categories, in parallel to the findings of Endeva's "Energize the BoP" publication: The second chapter summarises challenges regarding the interaction with customers, which are linked to sales and marketing in rural areas, payment and delivery of charged devices, and technical customer service. The third chapter refers to the often-challenging acquisition of resources, which include market insight, local human resources, and finances. The fourth chapter shows future strategies of energy kiosk projects, and lists key factors for their success.

Methodology

The question we wanted to answer in our research: **"What is keeping energy kiosk businesses from reaching their full potential, and what are their plans to overcome their main challenges?"**

In a thorough benchmarking process, we found 23 energy kiosk companies worldwide, and 18 of them offered to share their experiences. In interviews, we asked them about their challenges and best practices regarding their product mix, meeting their market demand, designing the customer interface, human resources, and sustainable financial planning.

The last point regarding financial sustainability led to intense discussions on the future of the energy kiosk model. This is why we consulted twelve experts from different sectors, asking them about their experiences with similar business models serving low-income customers. These expert interviews helped us find first answers on an underlying question that came up throughout the project: **"What are key success factors for the future strategy scenarios of the energy kiosk model?"** We collected and summarised our major learning points in this paper. You can find more information on the interview partners in the section "Acknowledgements".

The State of Energy Kiosks

Energy kiosks have been set up all over the world. Most of them are found in India and Eastern and Western Africa, though individual projects also operate in Central Africa, Southern Africa, South-East Asia and the Caribbean. The majority of energy kiosk initiatives date back less than 10 years, founded in the years between 2005 and 2013.⁰¹ The number of operational kiosks per company is low in most cases. As of June 2014, only three projects with more than 25 stations running could be identified, two of them being public programmes. Two thirds of the benchmarked companies and organisations are running less than ten energy kiosks each.

01. The research was conducted between February and June 2014. All figures date back to this time.

The existing energy kiosk businesses are currently in different stages of project development. Seven companies out of 23 are currently prototyping their technology and business model, setting up first trial series of their energy kiosk version. Two companies have to be located between the prototyping and replication phase. Both have tested their model several times, but are only building new energy kiosks if a third party requests a station and provides funds. These companies are therefore operational, but not striving for further growth or development of their model; instead, they focus on other technologies as core business. Five out of 23 companies are operating their existing stations, but are not growing in numbers any more. The reasons for this vary: some are dependent on further public or private funding and some could not prove their business model to be economically sustainable, but are operating the already set up stations with a positive social impact. Nine out of 23 companies entered the phase of replication. They claim to have validated their technical design and operation model, and are trying to scale up their business.

SEE
FIGURE 2
NEXT PAGE

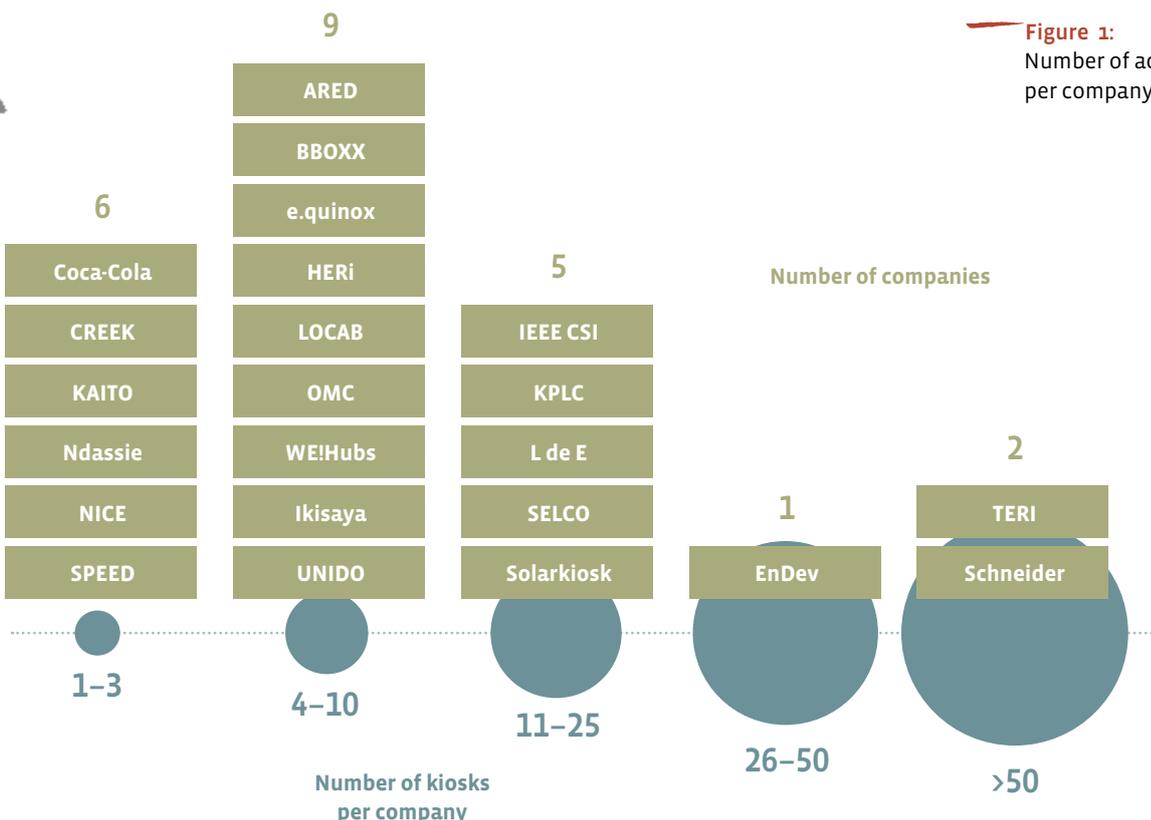


Figure 1: Number of active energy kiosks per company (n=23)

The State of Energy Kiosks

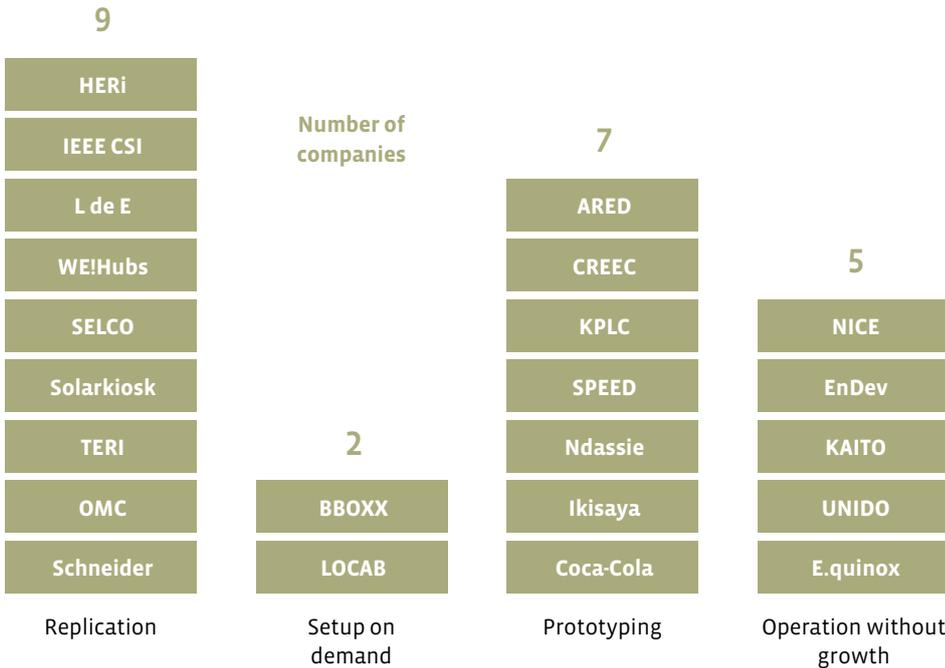


Figure 2: Phases of kiosk projects; companies sorted by their status in 2014 (n=23)

The central service of the energy kiosk model is the charging of batteries, lanterns, and mobile phones. Almost all companies offer either lamp or battery charging services, and more than half of them also charge their customers' mobile phones. Customers frequent the kiosk between one and seven times per week, depending on their individual needs and the size of the battery.

Many kiosk operators use surplus solar energy to offer services in addition to charging devices: screening movies or football matches, providing internet access and copying services, selling cooled drinks, or offering haircuts with electric razors. Other options to diversify the kiosk portfolio include water purification, and the sale of electric products such as torches or fans.

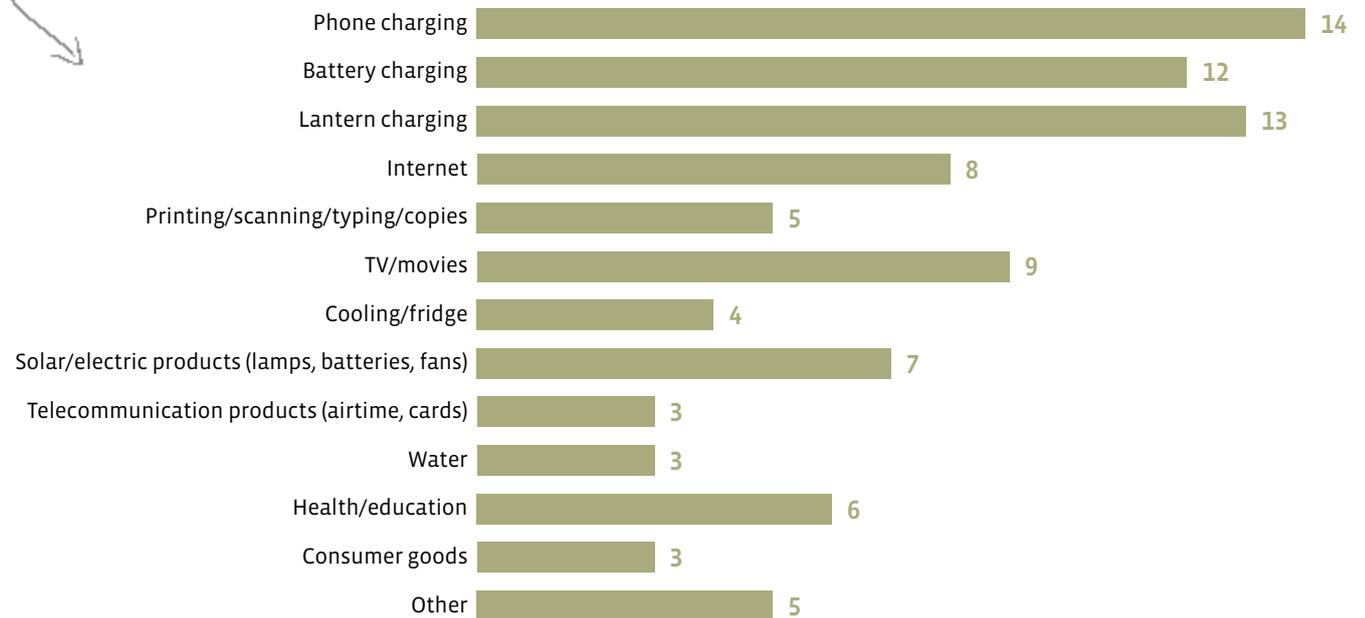


Figure 3: Variety of services and products offered in the energy kiosks (n=23)

Benefits of participatory market research

Access to funding is crucial for the success of the kiosk projects. More than half of all benchmarked companies rely fully or partly on multilateral, international, or governmental donors. Other common sources of funding are foundations, private donors, and corporate social responsibility (CSR) budgets. Only few companies refer to their own funds, banks, or investors in order to finance their business.

Almost half of all benchmarked companies can be defined as non-profit initiatives where profit is – if it exists at all – only considered as an indicator for sustainability and is usually reinvested into the kiosk business. As the matrix below shows, all companies clustered as non-profits are predominantly funded through public or private donors or through CSR budgets. The energy kiosk companies that do consider profit creation as a core indicator and aim at setting up sustainable business models vary in their main source of financing. They either cross-finance their kiosk businesses with other activities, or rely on investors, banks and their own funds in order to cover upfront costs.

SEE "FINANCIAL CHALLENGES" PAGE 23

Figure 4: Companies clustered according to main source of funding and relevance of profit creation (n=22, without SELCO⁰²)

		Non-profit			Profit	
		1	2	3	4	5
		Profit creation does not matter; all that matters is the social impact.	Profit is only an indicator for sustainable social impact.	Social impact matters, but the business must sustain itself.	Profit creation and social impact have the same importance in the decision making	Profit creation is the main goal of the venture.
Main source of funding	Investors				HERi Solarkiosk	
	Banks				L de E	
	Own funds			Ndassie	ARED KAITO NICE	
	Cross-financed within company			BBOX OMC		
	CSR budget	Coca-Cola		Schneider		
	Foundations/ private donors		IEEE CSI	e.equinox SPEED ⁰³		
	Multilateral/ international/ governmental donors	UNIDO CPC	CREEC EnDev Mali Ikisaya KPLC LOCAB TERI LaBL ⁰⁴	WE!Hubs ⁰⁵		

02. SELCO is not included in this matrix due to its complex and diverse setup which does not allow any general statement on the profit creation of its Integrated Energy Centers.

03. Private donations are used for project development and community engagement in the SPEED project, while technology, infrastructure and manpower is covered by an investing energy supply partner company.

04. Private and corporate donations and equity are also significant for the funding of the TERI LaBL initiative.

05. The WE!Hubs are also funded through foundations/private donors and corporate CSR budget.

Interacting with the Customers – 10 Challenges and Solutions

Challenges regarding the **customer interface** are linked to sales and marketing in rural areas, payment and delivery of charged devices, and technical customer service.

The kiosk companies developed **different strategies** to avoid or alleviate these difficulties.

While some became experts in **skills training** for operators, others created **delivery models** for household batteries.

For all the challenges documented, kiosks have found **at least one solution that is being tested** or has been successfully implemented.

One thing is clear: to work most efficiently, all energy kiosk companies need to learn from each other.



Photo: Siemens Stiftung

The customers of the Kenyan WE!Hubs borrow lanterns and batteries. The hubs' staff provide customer services to ensure customer satisfaction.

Sales

Energy kiosks offer great services, but there is little point to it if potential customers do not know of, understand or believe the benefits they could reap.



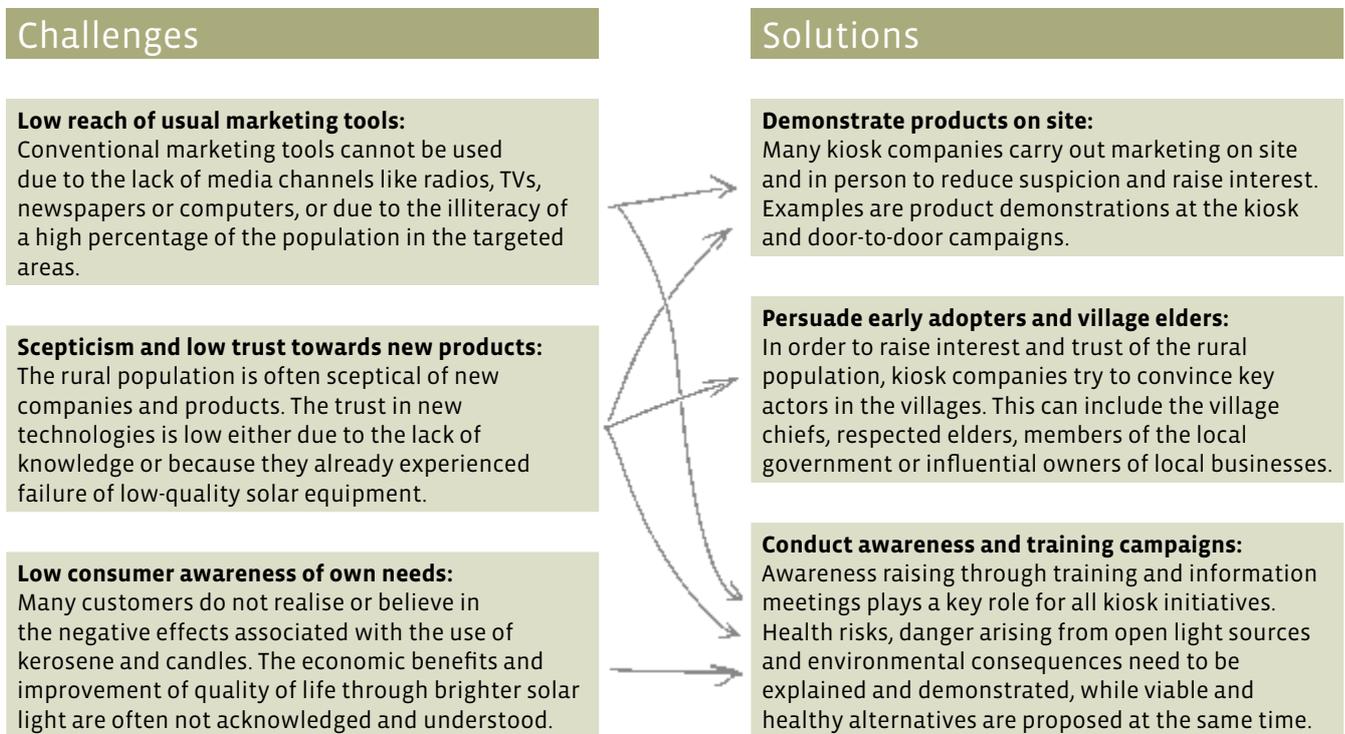
Most customers are loyal once they have begun using a certain product, but winning them in the first place takes time and effort. This is one of the insights HERi, a Malagasy energy kiosk company, gained in the last two years. In the villages in which HERi sets up kiosk stations, most people cannot read and do not have internet or a TV; only some own a radio.

This is why marketing in those regions requires a physical presence and personal contact with potential new customers. Half of the HERi team is therefore involved in marketing activities:

They organise opening events for new kiosks where lamps can be tried for free, they go from door to door to contact villagers, and even carry out product campaigns in schools. One by one, they gain new customers convinced of the advantages of renting one of HERi's kiosk lanterns. In 2015, HERi wants to go one step further: Plans for mobile marketing are in the pipeline because many villagers own mobile phones.

Interacting with the Customers – Challenges and Solutions: **Sales**

Marketing activities are not only essential to draw attention to the products and services of a new energy kiosk, but also to explain and raise awareness of the consequences of using or not using renewable electricity. Building trust takes time and resources, but energy kiosk companies agree that their best practices are worth the effort:



Payment and Delivery

As energy kiosks aim to satisfy the needs of remote households, they operate in underserved regions with little infrastructure and widely dispersed customers who irregularly visit the energy kiosk.



Photo: Mary Roach, OMC 2012

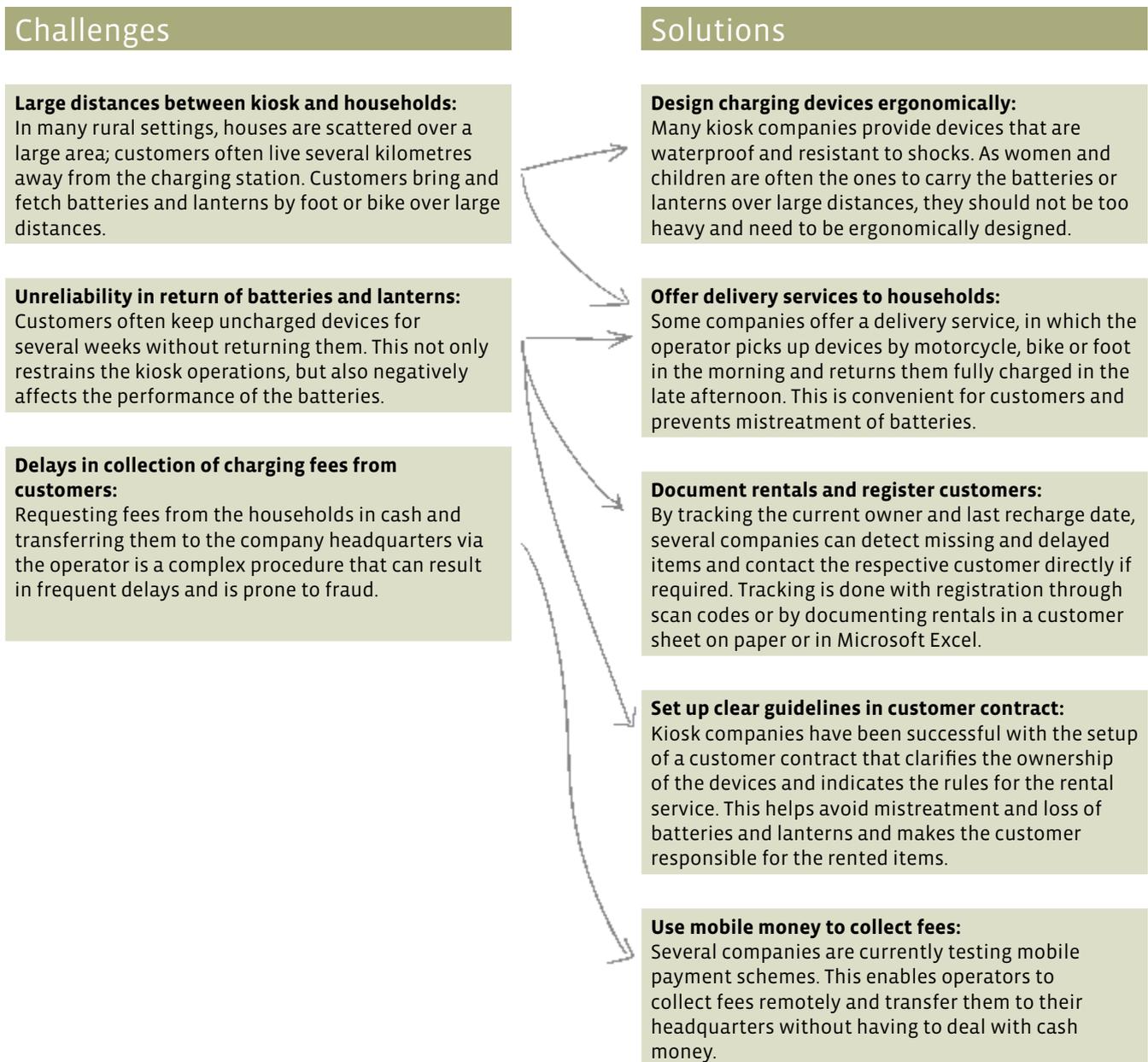
OMC's energy kiosk customers in rural India are scattered over a large area. The households that would like to take advantage of the service are located up to 5 kilometres from the next charging station. It is mainly women and children who fetch the heavy batteries from the kiosk stations and carry them all the way back home, every day.

In order to make life easier for their customers and attract remote households to the service, OMC offers a battery distribution service: three employees of the station go around with motorcycles and pick up empty batteries from customers in the morning. In the afternoon, the batteries are delivered to the households fully charged, so that they can be used during evening and night time.

This service provides 1,000 households per kiosk with charged batteries at their doorstep – every day!

Interacting with the Customers – Challenges and Solutions: **Payment and Delivery**

The delivery of batteries or lanterns and the payment of the service must be managed over large distances and mostly in the absence of paved roads and public transport. Energy kiosk companies have developed different ways to make interaction as convenient for customers as possible, while ensuring smooth operation of the energy kiosk business:



Service

Sensitive batteries and low awareness of customers make technical customer service an important aspect for energy kiosk companies.



Photo: Gilda Mojane, Lojas de Energias

In her “Lojas de Energias – Energy Shops”, Gilda Mojane sells solar home system, improved cookstoves and low-consumption light bulbs, and rents out charged lanterns. In total, she runs 35 energy kiosks in Mozambique, and she knows that her customers expect good quality.

Apart from offering robust and well-designed devices, customer service is key in order to keep users’ trust. Gilda and her colleagues are sure to make themselves approachable, and proactively visit households on a frequent basis. They check if the devices are working properly, monitor their performance, and give technical advice.

Gilda is looking for more partners to carry out customer service with her, because she realised: Service is not only about building trust, but also attracts valuable new customers – the family, friends and neighbours of her satisfied clients!

Interacting with the Customers – Challenges and Solutions: **Service**

The charging service offered by energy kiosks works on batteries or devices that include batteries. These batteries are sensitive and require proper treatment and maintenance. At the same time, most customers renting a battery lack adequate knowledge on how the device functions and how it should be handled. Thus, intense customer support is necessary to minimise system failure and to keep customer satisfaction at a high level. In order to do so, energy kiosk companies employ various service practices:

Challenges

Slow and unreliable reaction in case of problems:

In case of technical failure of the charging devices, fast and reliable action is required. The lack of skilled technicians in targeted regions and the unavailability of spare parts often leads to long waiting times until a device is repaired.

Lack of technical knowledge of operators:

Customer service carried out by operators is only feasible if the kiosk companies have skilled and reliable local partners in place. In many cases, the low level of knowledge and skills make it difficult for operators to provide high-quality service.

Poor care for products due to lack of ownership:

Unlike a solar home system (SHS) or a grid connection, the households do not own the device they use for electricity generation and transformation. This results in a low feeling of ownership, less care and lower motivation to use the charging service frequently.

Low customer satisfaction:

Several companies reported customer complaints related to technical problems with devices, the low quality of the charging service and inadequate customer support provided. Frustration with the service results in low customer retention, and unstable revenues for the kiosk company.

Solutions

Organise customer service through operator:

In some kiosk projects, technically skilled local operators provide customer service for replacement and maintenance at the kiosk during certain service times. Alternatively, some kiosk operators visit customers proactively in order to check devices and monitor their performance.

Support service activities through company technicians:

Companies that provide customer services centrally send technicians from the headquarters to the village. This can be done in regular intervals or upon request of local operators or customers.

Carry out technical training and awareness raising:

Technical training and demonstrations carried out by most energy kiosk companies help familiarise the rural population with the proper use of technology and can reduce the number of technical problems.

Request deposit payment for specific battery or lantern:

In order to rent a battery or lantern, most energy kiosk customers pay a refundable deposit upfront, which is reimbursed if the customer stops using the charging service and returns the device in good condition. The association of the deposit to one specific device creates a feeling of ownership for customers.

Introduce regular surveys and complaints mechanism:

Many kiosk initiatives carry out regular surveys and collect input through a complaint form. This helps adapt services to the wishes and needs of customers. In addition, contact with village key persons is often an essential channel to collect feedback from the community.



Acquiring Resources – Challenges and Solutions

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The **resources needed** for energy kiosks include market insight, local human resources and finances.

They are often challenging to acquire, but kiosk companies have developed **innovative strategies** to overcome obstacles in gaining market insight, managing local human resources and reaching financial stability.



Photo: SolarKiosk GmbH

Operator training in Olkiramatian, Kenya. Training sessions occur before and after Solarkiosk implementation and help the operator with the technical and business aspects of operation.

Market Insight

In order to operate successfully, energy kiosk companies need to know their customers well, and need to be able to adapt their products and prices to the demand profile.



Photo: SELCO Foundation

Since 2012, SELCO has set up 18 of their “Integrated Energy Centres” in rural and urban India. Unlike many other energy kiosk initiatives, SELCO does not start with a set model or service, but adapts the needed services to the specific location and context: before a new centre is established, a detailed survey is carried out in order to get an overview of the needs and the willingness to pay of the households in the area.

Each Integrated Energy Centre starts with small number of around 30 customers and initially offers only charging services. However, most of SELCO’s kiosks have scaled up quickly, and added other services on demand. Multiple services and purposes are possible, based on local customers’ demand. As a result, each Integrated Energy Centre is custom designed by asking and listening to users along the way..

Acquiring Resources – Challenges and Solutions: **Market Insight**

Energy kiosks target a very specific market niche: households in rural areas without access to grid electricity, which do not have the opportunity to buy their own solar home system, but are still interested in and willing to pay for electricity. These households have certain needs related to energy services, often varying with income levels, which often fluctuate seasonally. Competing energy solutions such as solar home systems or grid connections can influence the need for charging services. Different strategies to gain market insight and to adapt to the demand exist; most companies employ a combination of several of them:

Challenges

Challenging identification of context specific needs:
It is essential for kiosk companies to understand specific needs in each target area in order to prevent low sales numbers and wrong initial investment decisions. Market data is however often not available.

Low and fluctuating level of demand:
The kiosks' number of customers often remains lower than expected and too low to create a sustainable business. The reason for this is often the seasonally low income of rural households and the low priority of electricity in spending patterns.

Demand for different levels of electrification:
Wealthier households demand a higher standard of electrification, being aware of the advantages of electricity connections at home. They would like to run TVs, refrigerators and other electric household equipment with high loads.

Competition through alternative solutions:
The battery or lantern charging service has to compete with kerosene and candles as existing alternatives at most sites. Additionally, SHS distributors are increasingly reaching rural areas, providing another competitive solution. Some energy kiosks are even located in areas that the central grid covers.

Solutions

Conduct surveys before kiosk setup:
Companies carry out customer assessments to clarify the potential use of electricity, the current energy expenditure, and the willingness to pay. They also help estimate the impact of competitive solutions such as kerosene or solar home systems.

Offer other products and services:
Some companies offer energy related products such as light bulbs, small radios, or fans. Also electricity-based services, e.g. printing, cooling, or TV screenings are often added to the kiosk portfolio if requested by customers.

Customise the charging service:
Most kiosks rent out chargeable devices with different electric capacities. Prices are graded, allowing customers to adapt their electricity expenditure. Higher income households can refer to large batteries and can charge those more frequently.

Offer different payment schemes:
Although most kiosk companies prefer monthly battery rental for easier planning, they also offer short-term payment schemes per day or per charge. This imitates the advantage of kerosene and candles that can be purchased in very small amounts.

Create high quality offer with competitive prices:
Kiosk operators set prices for electricity at the energy kiosk equal or lower than what households would pay for fuel-based lighting for the same amount of hours. At the same time, the quality of light is much higher and health hazards due to emissions are lower.



Human Resources

The success of an energy kiosk depends largely on the skills, motivation and performance of the local operator.



Photo: e.quinox

One of the main aims of e.quinox, a student initiative from Imperial College London that sets up energy kiosks in Rwanda and Tanzania, is to encourage local entrepreneurship in East Africa.

However, their experience over the past 5 years, starting in 2009, shows how difficult the access to talent is. In order to ensure smooth kiosk operation, e.quinox set basic requirements for local staff: primary school education is necessary, accounting skills for potential operators is desired, and business experience is ideal. e.quinox involves the local government in the selection of operators by asking for a shortlist of candidates.

After an intense one-day-training with applicants, e.quinox selects its new employees. Despite this careful process, continuous supervision of operators is needed. Thus, e.quinox collaborates with nearby universities to provide monthly support at the kiosk through engineering students.

Acquiring Resources – Challenges and Solutions: **Human Resources**

The local kiosk operator is an employee or independent entrepreneur, and is the link between the energy kiosk company and the customers. Kiosk operators have a central role, and their skills, abilities, and engagement directly affect the quality of the charging service. Many energy kiosk companies consider access to talented and educated candidates as a challenge. They developed several practices to manage the selection and support of operators in order to ensure a high-quality service:

Challenges

Low level of basic skills and abilities of operators:
Despite careful selection, the educational background of operators is in most cases not sufficient to operate an energy kiosk. Many candidates lack basic skills such as reading, writing and number recognition, do not have technical skills, and are not computer-literate or experienced in accounting.

Differences in the management culture:
The differences in management culture between professionals from different continents concern companies with headquarters in western countries with local employees in countries of operation. Often, the local management practices do not live up to ‘western’ standards.

Local operator fraud:
Many energy kiosk companies have dealt with criminal activity involving individual operators. These could be small, isolated incidents, but also severe fraud, such as the repeated theft of money.

Low operator engagement:
In some cases, operators do not show up to their shifts at the kiosk during core business times, do not maintain the station properly, and show little motivation in general. Kiosk operators sometimes move to bigger cities after having gained skills and reputation in the charging business.

Solutions

Define minimum criteria for applicants:
In order to make sure that the prospective operators are able to run the station independently, most companies set minimum criteria for applicants. These include the ability to read and write, basic computer skills, and basic accounting or maths skills.

Choose operators with business experience:
The majority of energy kiosk companies prefer operators who already have experience in business. Candidates with previous experience have sales and accounting skills as well as an entrepreneurial spirit, and are more likely to succeed with an energy kiosk business.

Establish initial business and technical training:
The training education for operators carried out by almost all kiosk companies ranges from one day to one month, sometimes followed up with continuous long-term training. Training is comprised of sales skills, technical aspects, and knowledge on payment and bookkeeping. A more experienced kiosk operator or company manager often delivers part of the training at the kiosk site.

Provide support and supervision through visits and calls:
To minimize the risk of low performance, fraud and technical failure, many kiosk companies supervise the local operator through regular phone calls and visits. The purpose of this supervision is to provide support, for example with marketing and customer service.

Consider the choice of the kiosk operation model:
The choice of operation model can affect the kiosk performance significantly. Many companies employ operators directly in order to provide financial security as an incentive, accepting a high risk of some degree of fraud. A franchising system means less opportunity for fraud, and fosters entrepreneurial thinking in operators.



Finance

High upfront costs and low revenues make it difficult for energy kiosk companies to reach financial stability.

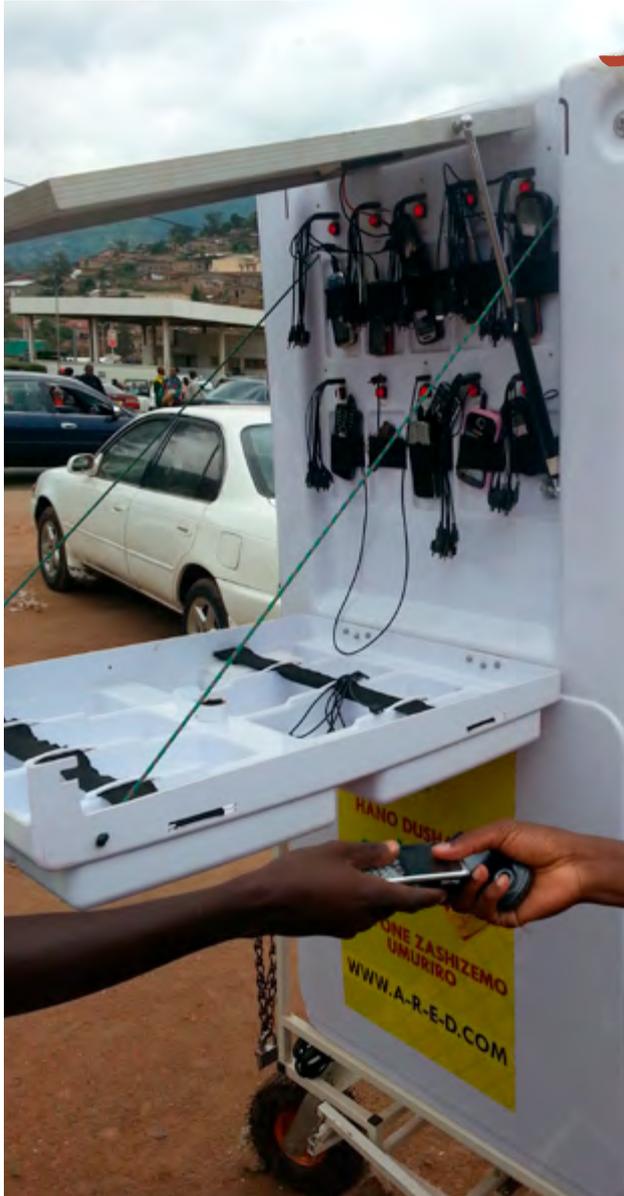


Photo: ARED

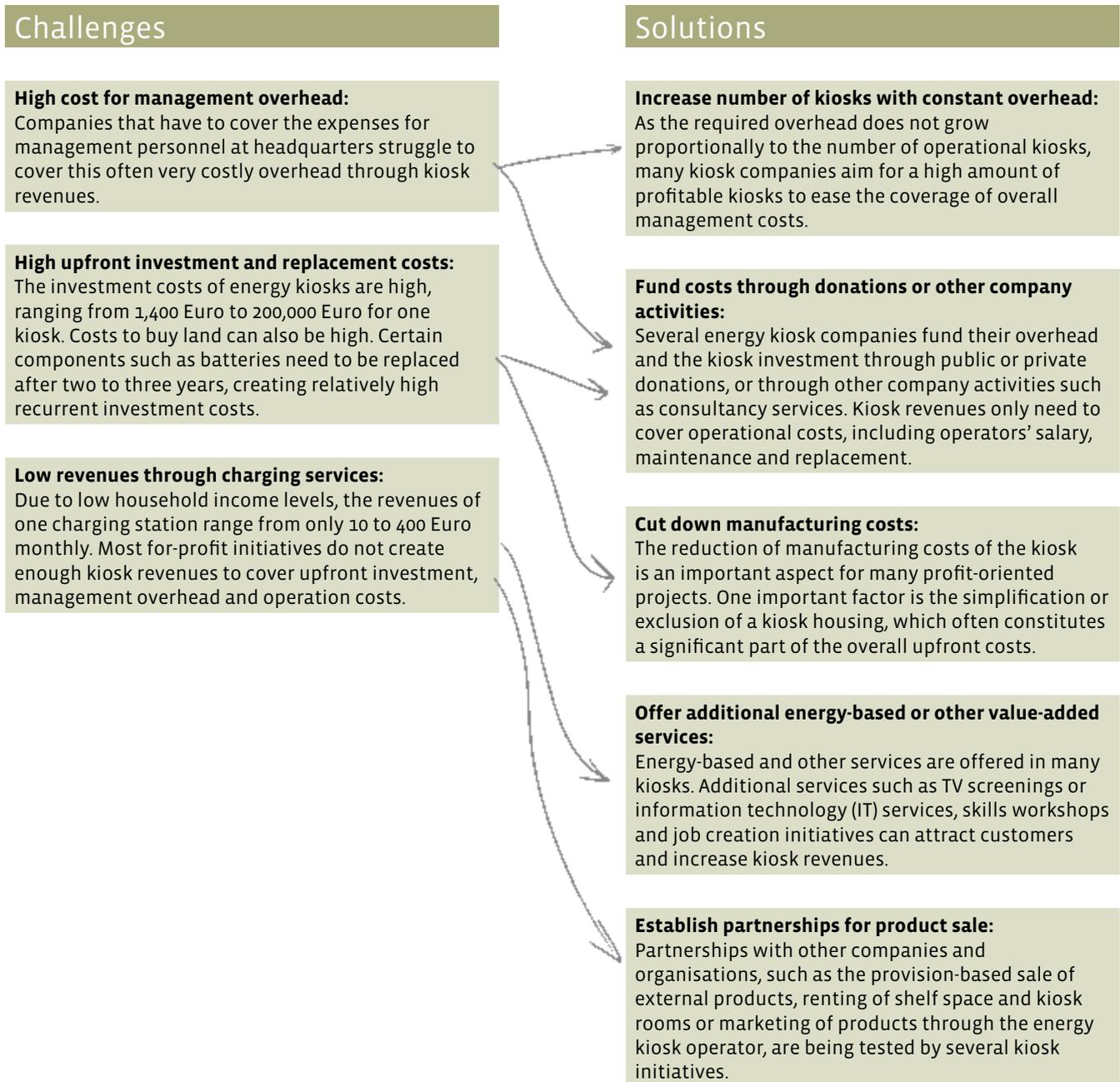
Financial sustainability is a central concern for ARED, an energy kiosk company running seven mobile charging stations in Rwanda and Burundi. Their first stations offered only phone charging. However, it quickly became clear that this alone is not creating enough income for the kiosk operators, and that revenues were too low to cover ARED's investment. As one solution, ARED is now starting to offer telecommunication products such as SIM cards and airtime. In addition, ARED signed a contract with Airtel, a large telecom company, and is now branding all its kiosks with the Airtel logo. There are also plans to soon offer internet access at all stations. One kiosk has already extended its portfolio and reports that it could triple its revenues.

ARED is aware that for a sustainable financial model, a large number of kiosks is needed and has made plans to scale up to several hundred mobile stations. So far, ARED mainly self-funded its activities. In order to grow in numbers, external funding through public grants or private investors is needed. There are good chances for success: ARED managed to cut its manufacturing costs by half, and is confident in its ability to bring on potential investors with the progress made in the last two years.

Acquiring Resources – Challenges and Solutions: **Finance**

Energy kiosk companies have found smart and effective answers to everyday challenges, on demand assessment, customer interface, and operator support. The remaining, pressing question is, how can energy kiosk projects create overall financial sustainability?

Due to the high upfront investment of up to 200,000 Euro, and the low fee per transaction – often around 10 to 50 Euro cents – profit-oriented companies in particular struggle to find ways of operating their energy kiosks in a way that is financially sustainable in the long term.



Future Strategies for a Sustainable Business Case

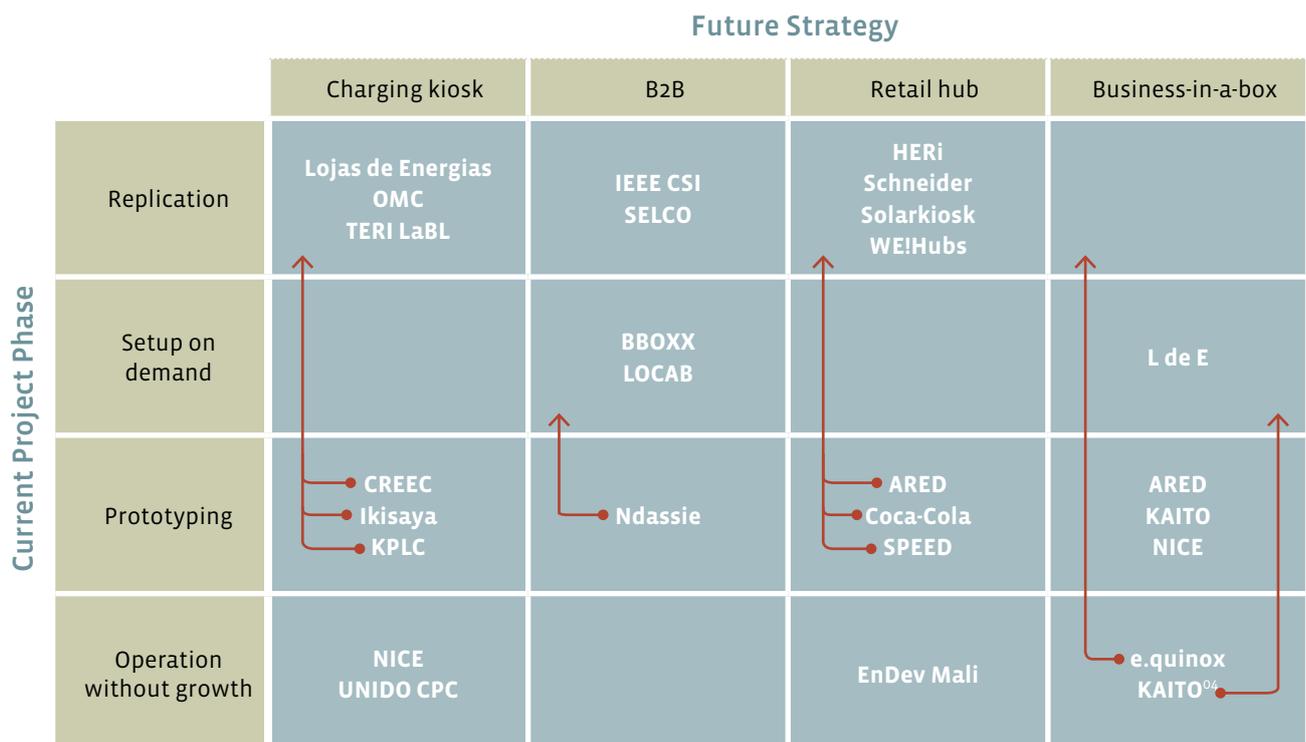
The search for answers leads many companies in the direction of changing the initial business model of a classic charging kiosk. Overall, the endeavour to decrease costs and increase revenues results in three alternative future strategies:

- **Business-to-business (B2B):** In this concept, energy kiosk companies are not operating the charging kiosks themselves, but selling the kiosk infrastructure to a local customer, e.g. a company, non-governmental organisation (NGO), bank or community, as customer.
- **Retail hub:** This strategy extends the portfolio of classic energy kiosks by additional products and services. The resulting kiosks are a combination of a charging station and a retail and service hub.
- **Business-in-a-box:** This approach decreases the size and investment cost of charging stations significantly. Small charging “boxes” are sold to the local operators via a payment scheme.

As the matrix below shows, many companies are currently testing one of these three strategies, running first prototypes. The red arrows indicate that most of them aim at replicating their kiosks with their new strategy, or at least want to set up additional sites on demand. Several companies already entered the replication phase with the retail hub and B2B strategy; the majority of these companies are just beginning to scale up.

Next to the companies following the three strategies mentioned, there are some kiosk initiatives that do not see financial sustainability as a key priority. Those projects plan to continue the standard kiosk model and are represented in the first column.

Figure 10: Companies clustered according to their future strategy (n=23)
Source: Interviews with companies



06. KAITO is also available for B2B energy kiosk sale, if a customer requests kiosk hardware.

Business-to-Business

Energy kiosk businesses develop and sell the hardware for charging stations to direct customers such as companies, but also to non-business customers such as non-governmental organisations, public institutions, and communities.



Photo: BBOXX

Selling solar home systems as a core business, the British company BBOXX also discovered the sale of energy kiosk hardware as a revenue stream. For the Scottish Government, they set up six energy kiosks in Malawi, which are run by a social enterprise founded for this purpose. BBOXX also sold kiosk infrastructure to various other projects. They provide technical support to their customers, but are not involved in operations otherwise. Their customers are mainly non-governmental organisations and public institutions, which look for social impact instead of profit.

Description

Kiosk companies following a B2B approach develop and sell the hardware for charging stations to companies and organisations instead of selling electricity to individual end-consumers. In this case, B2B also includes non-business customers such as non-governmental organisations, public institutions, and communities. Unlike the classic energy kiosk model, the company is not involved in the management of operations; this is the responsibility of the customer purchasing the kiosk. Revenues for the kiosk companies come from the sale of the kiosk infrastructure. The buyer of the kiosk carries costs and risks associated to the operation.

Key Success Factors

Energy kiosk companies operating with a B2B strategy can ignore many problems that they would face with a classic charging kiosk approach. Examples are the challenges related to end consumer relations and the cooperation with local operators, as the companies are not involved in local management and operation of the kiosk stations. However, three key success factors need to be considered for the B2B concept.

Companies following the B2B strategy need to:

- 1. Identify solvent customers in need of the product**

In order to successfully market and sell energy kiosk hardware, the B2B companies need to identify potential direct customer groups. Important features are the motivation of companies or public institutions to pay the high upfront investment costs and carry all risks related to the kiosk operation – and their disposal of financial means to do so. Development agencies, multinational companies and international organisations are usually solvent partners, having an interest in supporting rural development and have the necessary financial means. Some energy kiosk companies also look for connections to communities and local NGOs as partners to operate the energy kiosks. Their ability to cover the upfront costs needs to be investigated case by case.
- 2. Establish partnerships for distribution**

Product delivery to the final site of operation is often associated with high costs and delays as distribution structures are for the most part absent in rural areas of the Global South. B2B kiosk companies need to deliver technical components, sometimes even including a kiosk housing, to remote areas. Shipping the hardware to central delivery points such as major cities and harbours seems to be a good practice. The customer, for example a local NGO or company, could take responsibility for the collection of the equipment from the delivery point. In most cases, however, a turn-key delivery is requested. Then, the energy kiosk company should find a partner operating in the country that is able to transport and assemble the kiosk on site. Finding such reliable partners for logistics in the countries is a key success factor for B2B energy kiosk companies.
- 3. Create a support structure for aftersales**

In case of technical failure, repair and replacement have to be provided. As long as guarantees are valid, this is the responsibility of the B2B kiosk company as technology provider. The energy kiosk company has to react quickly if it is informed about technical problems and failure. For this, local partners with technical expertise are also needed. In that way, repair and replacement as well as technical advice can be immediately provided on site

Retail Hub

Charging kiosks extend their portfolio of products, ranging from electric equipment to consumer goods, and offer a variety of services. The refitted kiosks become multi-purpose stations that can multiply their revenues through their extended offer.



Photo: Solarkiosk GmbH

Solarkiosk GmbH, a German-based company, is operating energy kiosks in rural areas of Ethiopia, Kenya, Botswana and Tanzania, and works on expanding to Ghana and Rwanda.

The vision of Solarkiosk is that its stations are social gathering points as a local source of entertainment, education, light, and products. Therefore, Solarkiosk does not limit its services to the charging of mobile phones, batteries, and lamps, but also offers extras like cooling and internet. Additionally, every kiosk offers purchasable products ranging from solar home systems, to electrical appliances and fast-moving consumer goods. This makes Solarkiosk's stations a diverse rural and diverse retail hub that is attractive for rural customers and partner companies alike.

Description

The provision of electricity makes the energy kiosks a central gathering point of each village. In addition, the energy kiosks are often the only brightly illuminated businesses after sunset. The availability of electricity and the central location of the kiosk make it an interesting multiplier for other products and services. This is why some companies decide to transform their charging kiosks to retail hubs by extending their portfolio. The refitted kiosks become multi-purpose stations that create revenues not only from charging services, but also through other products and services.

Among the respective energy kiosk companies following this strategy, there exist different approaches to equip retail hubs. While some focus lies on the sale of consumer goods and solar products, there is also a focus on investigating partnerships with consumer- and agribusinesses or offering a broader variety of services, like clean drinking water, IT services and skills training. In most cases, companies have recently set up or extended their energy kiosks to retail hubs, and are currently prototyping the approach.

Key Success Factors

As retail hubs are managed very similarly to pure charging stations, the two strategies also share many challenges. Examples are issues regarding the customer interface, identification, and satisfaction of the market demand and the cooperation with local operators. The focus here is on three critical points that arise specifically for retail hubs. Companies following this strategy should:

- 1. Set up a last mile distribution infrastructure**

Shifting the offer from electricity charging services to the promotion and sale of tangible products requires the establishment of diverse last mile distribution channels. The lack of distribution channels is a major hurdle for retail hub companies. Retail hubs themselves are part of the solution to the distribution problem in remote areas. However, the delivery of products to the retail hub is challenging in most rural areas. For smooth distribution, companies operating in similar fields establish regional inventory points or warehouses.
- 2. Establish a clear reporting and tracking system**

With the diversification of the portfolio and increase of hub numbers, it becomes more challenging to keep an overview over all company activities and data, especially stock. A structured reporting and tracking system is a key success factor to keep all activities in line and reduce inefficiencies and misunderstandings. For this, a high level of standardisation with clear guidelines and responsibilities and online tracking of orders, and deliveries are necessary. Despite the need for standardisation of procedures, successful last mile retail companies recommend establishing guidelines implicitly instead of setting up strict rules. Instead, continuous case-to-case contact and supervision of hub operators is necessary. Experience shows that one company representative based in a regional office or in the company headquarters can manage 5 to 20 local hubs.
- 3. Keep logistic costs low**

Transport of people and goods is associated with high costs; regular site visits are especially expensive. One key success factor is therefore the control of transportation costs. Retail hub companies have to consider this in their upscaling plans. One idea is a pre-order system for expensive products, e.g. electrical equipment, as pulling back of products creates additional costs. Also the establishment of a tracking system helps companies learn which products achieve high sales numbers, and plan deliveries accordingly.

Business-in-a-Box

Local micro-entrepreneurs purchase small charging “business boxes” that are mobile and feature simple technology. As owners of small charging businesses, the micro-entrepreneurs can offer mobile phone and lamp charging to their neighbours.



Photo: KAITO Energie AG, München

As a German company offering off-grid solutions for electrification in West Africa, KAITO tested the energy kiosk approach in 2009. The company operated three kiosks for two years, but revenues remained low, and the high investment costs could not be recovered. From 2012 on, KAITO changed its approach: Instead of large energy kiosks, they developed small charging stations, which are run by local entrepreneurs. Local micro-entrepreneurs can afford to buy such a charging station with a payment scheme over several months, and get training and support from KAITO.

They can subsequently offer charging of mobile phones and lamps in their existing shops or to their neighbours. In a second step, the entrepreneurs can extend the station and start selling other electric equipment of KAITO to rural households. The initial charging stations do not have any housing structure; the technical equipment is simple and inexpensive. In this approach, KAITO sets the engagement and intrinsic motivation as a prerequisite, and withdraws from any involvement in the operation of the kiosks. In the long term, the charging stations will remain part of KAITO's portfolio, although they do not generate significant profits. Overall, the company focuses on micro-grid setups, and offers the charging stations as a solution to satisfy the needs of the poorest households.

Description

With the business-in-a-box approach, kiosk companies sell charging stations to local micro-entrepreneurs. In order to be affordable for local actors, the size of the charging kiosks is significantly smaller than in the energy kiosk approach. The business-in-a-box strategy is thus a micro-B2B strategy.

The micro-kiosks do not include a housing structure and have a significantly smaller power capacity, similar to a SHS. One system is usually designed to charge 10 to 20 phones or lanterns at a time. The charging systems can be installed in private households to serve the local entrepreneurs' neighbourhoods or in a small shop to serve their customers. The hardware is sold to the local micro-entrepreneur; revenues of the kiosk company result from the technology sale. The entrepreneur operates the charging business independently from the company. In order to make the business-in-a-box affordable for local partners, the kiosk companies apply payment schemes with a payback time of several months or years.

Two of the benchmarked energy kiosk companies have already shifted their business model from a classic charging station towards a business-in-a-box approach. Several other companies have already successfully implemented the business-in-a-box model for charging stations. Most of these companies sell SHS as their core business.

Key Success Factors

The business-in-a-box strategy for energy kiosks partially targets the same customer segments as regular charging kiosk businesses. Therefore, some key success factors are similar to the solution strategies for traditional charging stations, an example being the selection of micro-entrepreneurs and operators respectively. However, due to the different setup in the business-in-a-box scenario, many aspects such as the control and support of operators have to be redefined. For the success of a business-in-a-box strategy, companies have to:

1. Demand satisfaction

The micro-kiosks set up in the business-in-a-box approach have a relatively low power capacity. Thus, the kiosks can only cover very basic needs of customers, such as lighting and phone charging. Classic charging stations of a bigger size could potentially serve customers that claim electricity for larger appliances such as TVs or fans; micro-kiosks cannot satisfy this demand. In order to run the business-in-a-box model successfully, it has to be clarified that the local demand for electricity is at a sufficiently low level.

2. Minimal control effort

The term "business-in-a-box" is often used synonymously with microfranchising. In both the microfranchising and business-in-a-box approach, local entrepreneurs pay a fee to the central company. However, a microfranchising system requires common operational standards and a certain amount of

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control through the franchisor. For the business-in-a-box sale of small charging stations, this is not necessary. Companies do not need to set restrictions concerning operations to the local micro-kiosk entrepreneurs. Guidelines are provided in a short initial training and in an instruction manual with general information on the business setup.

3. Marketing and aftersales support

Marketing and technical support are indispensable, as the micro-entrepreneurs often do not have the necessary skills to accomplish this on their own. These aftersales structures are very expensive to set up. Costs for transport and field staff can easily reach high levels due to large distances and the need for extensive support. Due to the limited financial resources of kiosk companies, keeping these costs at a low level appears to be important in the business-in-a-box scenario.

4. System payback

Transport of people and goods is associated with high costs; regular site For financial sustainability, it is essential to sell enough systems with a payback time of one to three years maximum in order to ensure liquidity and financial sustainability of the respective company. At the same time, kiosk companies need to ensure that the operators make enough profits as micro-entrepreneurs so that it is attractive to continue the business and pay back the kiosk hardware. In order to ensure timely payment, personal collection of fees on the part of micro-entrepreneurs is necessary. As an alternative, there exist charging boxes that can be controlled remotely and that enable payment via mobile phone. In case that customers do not pay, the company can electronically lock the system until the next rate is transferred.

Some Final Words

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While the energy kiosk model has its challenges in the management of customer interfaces and acquisition of resources, there is reason for optimism. Many best practices and smart solutions have been developed, and improvement is possible if kiosk companies learn from each other.

The energy kiosk model has its justification where demand for energy is present but low. It should not be considered a competitive solution to grid connections or solar home systems, but an additional option for the lowest-income households.

The image of the energy kiosk model as a failed approach is far from being justified. Business development and the exploration of new strategies are needed, as there is a high potential to open up new avenues for financial sustainability.

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International Energy Agency, “Energy Poverty – How to make modern energy access universal?,” OECD, 2010.

Acknowledgements

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Energy kiosk companies

This research project would not have been possible without the active contribution of many energy kiosk project managers, who supported this study with their vast experience, openness, and patient answers:

Full name	Short form	Description	Interview partner
African Renewable Energy Distributor	ARED	ARED is a Rwandan company founded in 2012, providing energy solutions to rural and urban areas in East Africa. The product offered is a mobile phone charging station, called the Mobile Solar Kiosk (MSK). Independent entrepreneurs, in collaboration with ARED, run the stations. http://a-r-e-d.com/	Henri Nyakarundi, ARED founder
BBOXX	BBOXX	BBOXX is a UK company selling solar systems to individual households in various developing countries. BBOXX developed an energy kiosk model that is equipped with solar panels and the battery boxes designed by the company. The BBOXX founders are also the initiators of e.quinox, linking their expertise in kiosk setup to both initiatives. http://www.bboxx.co.uk	Christopher Baker-Brian, Chief Technology Officer BBOXX
The Coca-Cola Company EKOCenters	Coca-Cola	Coca-Cola is a multinational company selling beverages. The EKOCenter project was initiated in the scope of CSR activities. The stations are meant to deliver safe access to water and other necessities to communities in need. http://www.coca-colacompany.com/ekocenter#TCCC	Derk Hendriksen, Project Manager EKOCenters
Centre for Research in Energy and Energy Conservation	CREEC	CREEC is a Ugandan not-for-profit organization carrying out research, training, and consultancy. It works in close cooperation with the College of Engineering, Design, Art and Technology at Makerere University. One of their research projects is the solar field laboratory, serving as an energy kiosk at the same time. http://CREEC.or.ug/our-departments/solar-pv/field-laboratory/	Mary Suzan Abbo, Managing Director CREEC
e.quinox	e.quinox	e.quinox is a non-profit student initiative at Imperial College London. Its goal is to provide cost-effective, sustainable renewable energy to developing countries. e.quinox has been setting up one energy kiosk per year in the last five years; countries of activity are Rwanda and Tanzania. http://www.e.quinox.org/index.php/	Rushabh Mehta, Chairman e.quinox 2013–14
GIZ Energising Development Mali	EnDev Mali/ EnDev	EnDev Mali is a multinational program of GIZ, providing sustainable access to modern energy services. In Mali, the program set up 50 battery charging stations that are still operational. http://endev.info/content/Mali	Derk de Haan, GIZ Headquarter support for EnDev Mali
HERi Madagascar	HERi	HERi is a social enterprise founded in 2012 in Madagascar, setting up solar energy kiosks in rural areas.	Sylvain Martin, CEO HERi
IEEE Community Solutions Initiative	IEEE CSI	CSI is a non-profit member group of the IEEE Power & Energy Society. It works on the delivery of energy solutions to the world's poorest. IEEE CSI set up charging stations in Haiti, South Sudan, and Nigeria. http://www.communitysolutionsinitiative.org/	Michael Wilson, CSI Program Manager

Acknowledgements: **Energy kiosk companies**

Full name	Short form	Description	Interview partner
KAITO Energie AG	KAITO	KAITO is a German company providing energy technology solutions and consultancy in Senegal. Among others, KAITO has set up mobile charging stations for lantern and mobile phone charging. http://kaito-energie.de/ladestationen/	Wolfgang Hofstätter, Founder KAITO
Kenya Power Solar Stations	KPLC	KPLC is the Kenyan power utility, owning most of the electricity transmission and distribution system in the country. Its off-grid department is electrifying remote areas or Kenya. KPLC is managing energy kiosks in remote villages that are initiated and funded the University of Oslo. http://www.kplc.co.ke/content/item/14	Henry Gichungi, Head of Off-Grid Department KPLC
Local Capacity Builder	LOCAB	LOCAB is a non-profit organisation working on community development in Cambodia. Among others, LOCAB set up solar battery charging stations funded by UNDP. http://www.locab.org/	Pharith Kong, Chairman LOCAB
Lojas de Energias	Lojas de Energias/ L de E	Lojas de Energias is a SHS and charging station project in Mozambique. It was set up as a private-public partnership in cooperation of DEG, Phaesus and other actors. https://www.youtube.com/watch?v=ZFrpgQVkl4k	Gilda Monjane, Project Manager Lojas de Energias
NDASSIE Solar Energy Company	Ndassie	Ndassie is a Dutch company, designing and manufacturing solar charging stations for rural communities in Cameroon. http://www.ndassie.com/en/about-us/	Jean Seraphin Kpeguep, Founder Ndassie
NICE Gambia independent	NICE	NICE was originally founded as NICE International in the Netherlands; by now, the company is sold to local management in The Gambia. This company is not a classical energy kiosk, but rather a solar-based internet hub, providing IT and document services. NICE is still included as it was initially planned as a charging station and still bases its offer on electricity provision. http://nice-international.com/	Ties Kroetzen, Founder NICE International Omar Njie, Manager NICE Gambia independent
Omnigrad Micro-power Company	OMC	OMC is an Indian company providing micro power solutions for rural electrification. OMC sets up micro grids, combining them with battery and lantern charging stations. http://www.omcpower.com/communities	Dinesh Gupta, Chief Technology Officer OMC
Schneider Electric BipBop Program	Schneider Village Entrepreneurs/ Schneider	Schneider Electric is a technology provider for energy distribution and management solutions. Within its BipBop Program, Schneider Electric provides affordable energy access to the base of the pyramid. Among other projects, charging stations were established as retail hubs in rural India.	Ravi Bhushan, Project Manager Access to Energy India
SELCO Foundation	SELCO	The SELCO is an Indian non-profit organisation created by SELCO India in 2010. Its mission is to provide reliable energy services to the poor. One of SELCO's projects are the integrated Energy Centres (IEC) in rural and urban areas, serving as community hubs with multiple services. http://www.selcofoundation.org/project/integrated-energy-centres/	Huda Jaffer, Lead Designer SELCO Foundation

Acknowledgements: **Energy kiosk companies**

Full name	Short form	Description	Interview partner
Smart Power for Environmentally-sound Economic Development	SPEED	SPEED is a program initiated by TARA, cKinetics and others. It aims at providing clean and reliable energy services to the rural communities in India. One project of SPEED is a battery charging station complemented by a micro grid. http://smartpowerindia.org/Saran.aspx	Chaitanya Sure, Deputy Manager TARA, SPEED program
Solarkiosk GmbH	Solarkiosk	Solarkiosk is a German company setting up and operating energy kiosks in Ethiopia, Kenya, Botswana and Tanzania, planning to expand to Ghana and Rwanda. The first kiosk was set up in 2012. http://www.solarkiosk.eu/?page_id=14	Andreas Spieß, CEO Solarkiosk
Solar Transitions Project Ikisaya	Solar Transitions Ikisaya/ Ikisaya	The Solar Transitions Project is a research project at the University of Oslo, funded by the Research Council of Norway. In the scope of the project, a charging station/ mini grid were set up in the Kenyan village Ikisaya. http://www.sv.uio.no/iss/english/research/projects/solar-transitions/	Kirsten Ulsrud, Project Manager Solar Transitions
The Energy and Resources Institute – Lighting a Billion Lives Initiative	TERI LaBL/ TERI	The Lighting a Billion Lives Initiative is an Indian campaign coordinated by TERI, aiming at providing a large number of unelectrified households with modern energy services. Among others, the initiative sets up rural lantern charging stations. http://labl.teriin.org/index.php?option=com_content&view=article&id=6&Itemid=137	Dhairya Dholakia, Fellow Lighting a Billion Lives
UNIDO Community Power Centres	UNIDO CPC/ UNIDO	The CPCs are an effort of UNIDO to electrify rural communities in Kenya. The power centres consist of a micro grid and a battery charging station and serve as community development centres with various services and activities at the same time. http://www.unido.org/fileadmin/user_media/UNIDO_Worldwide/Offices/UNIDO_Offices/Kenya/CPC_Flyer_2.pdf	No interview conducted
Water-Energy Hubs	WE!Hubs	The WE!Hubs project in Kenya is a joint initiative of Osram, the Global Nature Fund, the Siemens Foundation and Thames Electrical. The WE!Hubs are battery and lantern charging stations which also provide clean water and other services. http://www.we-hub.org/	Udo Gattenlöhner, Global Nature Fund Gerhard Mair, Osram WE!Hubs

Acknowledgements: Further interview partners & Reviewers

Further interview partners

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Greg Starbird, CEO Healthstore Foundation

Iliana Lykissa, Researcher for SolarNow

Ken Fullerton, Program Manager EnerGcare

Rustam Sengupta, CEO Boond

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Thomas Ricke, CEO Villageboom

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