



Mobile for Development Utilities  
**Fenix International**  
Scaling Pay-as-you-go Solar in Uganda



---

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com)

Follow the GSMA on Twitter: [@GSMA](https://twitter.com/GSMA)



## Mobile for Development Utilities

---

The Mobile for Development Utilities Programme promotes the use of mobile technology and infrastructure to improve or increase access to basic utility services for the underserved. Our programme focuses on any energy, water or sanitation services which include a mobile component such as mobile services (voice, data, SMS, USSD), mobile money, Machine to Machine (M2M) communication, or leverage a mobile operator's brand, marketing or infrastructure (distribution and agent networks, tower infrastructure). The Programme receives support from the UK Government.

Author: Rahul Shah

---

### The Innovation Fund

The Mobile for Development Utilities Innovation Fund was launched in June 2013 to test and scale the use of mobile to improve or increase access to energy, water and sanitation services. In two phases of funding, grants were competitively awarded to 34 organisations across Asia and Africa. Seed grants were awarded for early stage trials, Market Validation grants for scaling or replication of business models, and Utility Partnership grants to foster partnerships between utility companies and innovators.

The specific objective of the Innovation Fund is to extract insights from the trial and scaling of these innovative models to inform three key questions for growing the sector:

- How can mobile support utility services?
- For a mobile-enabled solution to be adopted at scale, what building blocks are needed?
- What are the social and commercial impacts of delivering community services to underserved mobile subscribers?

These insights, as well as grant-specific learning objectives, are included in individual case studies such as this one, as well as thematic reports that will be published throughout 2015 and 2016.



---

This document is an output from a project co-funded by UK aid from the UK Government. The views expressed do not necessarily reflect the UK Government's official policies.

# CONTENTS

---

<b>EXECUTIVE SUMMARY</b>	<b>4</b>
--------------------------	----------

---

<b>INTRODUCTION</b>	<b>6</b>
Key Facts about Fenix	7
Grant Objectives	8
Market Opportunity	9

---

<b>FENIX'S BUSINESS MODEL</b>	<b>10</b>
The Value Proposition	10
Products and Pricing	10
Use of Mobile: Technology and Partnership	12
Marketing, Sales, Distribution and Customer Service	15

---

<b>EARLY RESULTS</b>	<b>18</b>
Business Model Viability	18
Refinements to Operations	20
Customer Benefits	21
Mobile Industry Benefits	22

---

<b>CONCLUSIONS</b>	<b>23</b>
--------------------	-----------

---

<b>APPENDIX: CASE STUDY METHODOLOGY</b>	<b>24</b>
---	-----------

---

# Executive Summary

In December 2013, the Mobile for Development Utilities Programme awarded the US-based company, Fenix International, Inc. (“Fenix”) a Market Validation grant to scale up ReadyPay Solar, its mobile payment enabled energy business in Uganda, through a partnership with MTN Uganda. Fenix offers off-grid customers in emerging markets a stand-alone solar system along with warranty service and customer support on lease-to-own terms over 18 months. Customers make payments via MTN Mobile Money, receive codes over SMS and use them to unlock the system with a wireless keypad.

The key objectives of the grant were to gain insights about scaling the pay-as-you-go (PAYG) solar model in Uganda with particular reference to demand for five product variants, most effective marketing channels, the trade-offs of using mobile money for payment collection, and the mutual benefits of partnership with a mobile network operator (MNO). A secondary objective was to test the demand for systems that were designed to support income-generating activities. Key findings include:

**Lease-to-own PAYG created demand beyond Fenix’s expectations with 13,000 systems sold in 2014:** The rapid uptake of ReadyPay Solar (a PAYG model) is evidence of how quickly demand can grow with access to convenient, flexible financing when compared to 100% upfront cash purchases. By leveraging and extending its existing operations for ReadySet Solar (a non-PAYG model), Fenix reached its 1,000-unit milestone in three months, exceeding forecasts. Further, Fenix projected selling 5,000 systems and exceeded estimates by selling 13,000 systems in 2014. Sales were significantly driven by customer satisfaction and word-of-mouth whereby over half of Fenix’s sales were facilitated through customer referrals.

**Fenix became the third largest bill pay account by transaction volume for MTN Uganda; Fenix customers are very active users of mobile money:** By creating a need to use mobile money and training customers to do so, Fenix helps MTN overcome two critical barriers to active adoption of mobile money. In 2014 alone, Fenix’s 13,000 customers made over 100,000 mobile money transactions. According to a survey of Fenix’s customers, 13% were new to MTN Mobile Money and signed up for accounts when they purchased the ReadyPay Solar system. As Fenix’s customers make frequent payments, MTN has found that their mobile money accounts are among the most active in Uganda.

**A wide range of systems have sufficient capacity to support income generation:** ReadyPay Solar systems come in five different kits sized for different income levels and customers can upgrade their systems by adding solar panels, LED lights, etc. as their incomes grow. One configuration of ReadyPay Solar is a 30W Business kit that supports income generation by enabling phone charging services (8 phones simultaneously and up to 20 phones per day). Although the higher-end Business kits comprised fewer than 7% of sales, over 20% of customers stated that they earned income through offering phone charging services. This indicates that even the smaller (10W and 17W) systems can generate sufficient power to charge phones beyond a family’s normal use, and thus help to defray cost.

**Fenix ReadyPay Solar largely displaces carbon-intensive sources of energy:** ReadyPay owners showed a strong shift away from unhealthy sources of lighting. Those using kerosene, car batteries and candles dropped from 66% to 10%, 14% to 6% and 10% to 4% respectively. Further, ReadyPay Solar eliminates the time and cost associated with travelling to buy carbon-intensive energy and charging phones. Finally, in addition to saving money, ReadyPay Solar provides improved lighting which enabled children to study an additional 1.6 hours per night.



The GBP 350,000 grant supported Fenix's efforts to raise capital. Just after the grant-funded project ended in January 2015, Fenix closed USD 12.6 million in Series B and working capital financing to accelerate production and provide its products to even more communities throughout Africa.

---

# Introduction

---

Fenix International, headquartered in Silicon Valley with offices in East Africa, was founded in 2009. Fenix designs, manufactures and distributes ReadyPay Solar, a mobile payment-enabled solar panel and smart battery system, which empowers off-grid residents with convenient, affordable access to clean electricity.

---

Since its inception, Fenix has focused on building robustly engineered products and a strong service model. Initially, Fenix experimented with products such as a bicycle charger before arriving at the ReadySet, a solar power system. The ReadySet was initially sold on a cash basis, targeted towards phone charging entrepreneurs, with a rapid 3-4 month payback. In 2013, Fenix began extending financing to household customers through channels such as reputable employer partners, SACCOs and MFIs. However, credit sales via these partners resulted in long sales cycles and monthly cash repayments were cumbersome to manage. Fenix integrated technology into the ReadySet to enable financed purchase through flexible payments over mobile money. The technology is conceptually simple

and enables an energy prepaid account analogous to a mobile prepaid account that Fenix's target market is very familiar with. With this technology, the ReadySet became ReadyPay Solar in November 2013.

Through this Market Validation grant, Fenix, in partnership with MTN Uganda, has verified that there is significant latent demand in Uganda for solar energy systems that can be activated through flexible financing. In response to the country's widespread need for electrification, accompanied by limited livelihood possibilities, Fenix has used the grant to also explore the market demand for entrepreneurial systems that can generate income through charging services.

# Key Facts about Fenix

FIGURE 1

## Company Overview as of December 2014

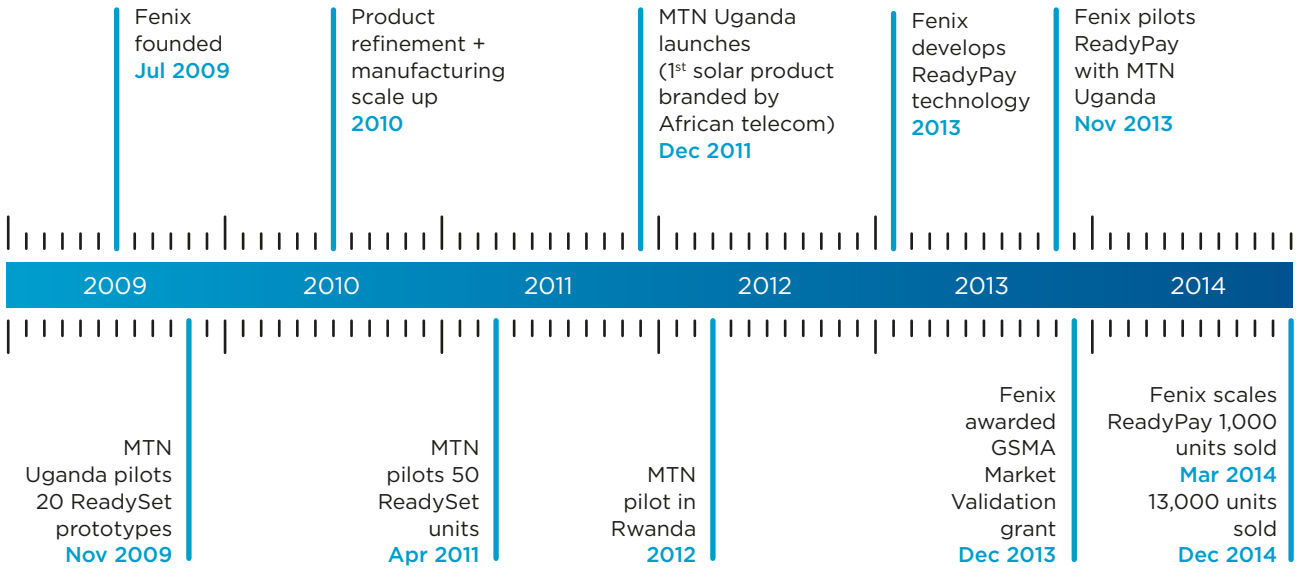
<b>Name</b>	Fenix International, Inc.
<b>Sector</b>	Energy (Solar)
<b>Year Established</b>	2009
<b>Country Footprint</b>	Uganda, Tanzania, Kenya, USA
<b>Product/Service</b>	Pay-as-you-go, lease-to-own solar systems (10W, 17W, 34W) with lighting and mobile charging as well as other optional appliances such as AM/FM radios and LCD TVs.
<b>Market Segment</b>	Households and small enterprises including shops that use the system for store lighting and/or to provide phone charging services.
<b>Total systems/ Customers served<sup>1</sup></b>	Total market penetration (all markets and systems): 50,000 systems, serving approximately 300,000 people Over 13,000 ReadyPay Solar sales in Uganda in 2014
<b>Use of Mobile: Technology and Partnership</b>	<ul style="list-style-type: none"> <li>• Mobile money for customer payments</li> <li>• Mobile operator's distribution channels and points of sale</li> <li>• Marketing and branding support</li> <li>• Mobile services for communication (customer care hotline and SMS notifications)</li> </ul>

Fenix's journey is mapped in Figure 2, including their continued expansion in Uganda. In January 2015, Fenix closed USD 12.6 million in Series B and working capital financing to accelerate production and provide its products to even more communities throughout Africa.

1. Sales and beneficiaries numbers are self-reported by Fenix

**FIGURE 2** Source: Fenix International

## Fenix's Growth



## Grant Objectives

The objectives of Fenix's Market Validation grant were as follows:

- Assess customer demand for PAYG solar for home and entrepreneurial use. Fenix's goal was to sell 1,000 ReadyPay Solar units across all its product lines during the grant period.
- Evaluate end users' willingness to use mobile money to pay for and adopt renewable energy to replace fossil fuel. Customers make payments entirely through mobile money. In addition to evaluating willingness to use mobile money, Fenix also wanted to evaluate the challenges and benefits of using mobile money for payment collection.
- Test and scale different marketing materials to build awareness among MTN Uganda's customers.

Fenix initially offered five types of products. By the end of the grant period, Fenix's product mix had changed slightly in response to customer needs, but is still comprised of five configurations.

The expected learnings for the broader pay-as-you-go solar sector, as defined by Fenix at the outset of the project were:

- What is the demand for mobile-enabled PAYG in Uganda?
- What are the challenges and opportunities of using mobile money to collect payments?
- Which marketing channels and materials are most effective to reach the target customers?
- What are the benefits to an MNO of partnering with a company like Fenix?
- To what demographic segments do these products appeal?
- How do solar systems impact customers' quality of life?



# Market Opportunity

## Addressable Market

The market opportunity for Fenix's offering is characterised by Uganda's low electrification rate of 15% (7% in rural areas and 55% in urban areas).<sup>2</sup> In contrast, about 97% of the 37.6 million population has access to GSM networks.<sup>3</sup> This means 82%, or 30.8 million, are within the addressable market that could leverage GSM networks in order to access new energy models and services. The majority of this market is the 85% of the population that lives in rural areas,<sup>4</sup> many of whom are among the 38% of people living below the poverty line.<sup>5</sup>

## Mobile Ecosystem

Uganda's market penetration of unique mobile subscribers is 30.5% which is just above the East Africa regional rate of 29.6%.<sup>6</sup> Of the six mobile operators, MTN led with a market share of 57% during 2014.<sup>7</sup>

MTN Mobile Money was launched in March 2009. There are currently six mobile money services in Uganda, of which MTN Mobile Money is the largest. For financial year 2013, MTN Mobile Money's subscriber base grew 47% to over 5 million mobile money customers who performed an average of 25 million transactions per month.<sup>8</sup> In financial year 2014, MTN Mobile Money's

subscriber base grew further to 7.3 million.<sup>9</sup> MTN Mobile Money's reach makes it possible for Fenix to efficiently collect payments from dispersed customers.

## Market Assumptions

Fenix began operations in Uganda based on the following assumptions about their target customers, made as part of their grant proposal:

- 6-9% of households in target areas have access to electricity,<sup>10</sup> with customers connected to grid growing at less than 7.5% annually.<sup>11</sup>
- Target households spend about USD 114 annually on kerosene<sup>12</sup> as well as about USD 0.17 per mobile phone charge.<sup>13</sup>
- Potential customers, engaged by the formal or informal sectors, have a daily income between USD 2 and USD 10, yet many own a mobile phone. Access to mobile-enabled finance could unlock the latent demand in this target segment.
- Mobile money was assumed to be accessible to most customers due to MTN Mobile Money's large nationwide agent network.

2. International Energy Agency, Africa Energy Outlook, 2014: <http://www.worldenergyoutlook.org/africa/>

3. GSMA estimate

4. World Bank Data Bank, 2013. <http://data.worldbank.org/indicator/SP.RUR.TOTL>; <http://data.worldbank.org/indicator/SP.POP.TOTL>

5. World Bank Data Bank, 2011. <http://data.worldbank.org/indicator/SI.POV.DDAY>

6. GSMA Intelligence, Q4 2014

7. MTN Group Integrated Report 2014: [https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2014/MtnGroupIntegrated\\_Report2014.pdf](https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2014/MtnGroupIntegrated_Report2014.pdf)

8. MTN Group Integrated Reports 2013: [https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2013/ar\\_integrated\\_report\\_2013.pdf](https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2013/ar_integrated_report_2013.pdf)

9. MTN Group Integrated Report 2014: [https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2014/MtnGroupIntegrated\\_Report2014.pdf](https://www.mtn.com/Investors/FinancialReporting/Documents/INTEGRATEDREPORTS/2014/MtnGroupIntegrated_Report2014.pdf)

10. International Energy Agency, World Energy Outlook, 2009: <http://www.worldenergyoutlook.org/resources/energydevelopment/accesstolectricity/>

11. Energy Programme Uganda: [http://www.energyprogramme.or.ug/download/2012\\_PREEEP\\_Rural\\_Electrification\\_Fact\\_Sheet.pdf](http://www.energyprogramme.or.ug/download/2012_PREEEP_Rural_Electrification_Fact_Sheet.pdf)

12. UNEP Off-grid Lighting Assessment: <http://luminanet.org/forum/topics/country-data-uganda#UmKvN2Q6WVs>

13. Fenix estimate

---

# Fenix's Business Model

---

## The Value Proposition

---

Fenix's business model creates value by offering customers 18-month loan financing for an energy asset that will replace customers' spending on kerosene, candles, and batteries. These energy assets also provide higher quality lighting, more reliable service, and the convenience of an in-home or in-business solution. Fenix's ReadyPay Solar systems are modular so customers can purchase the right system that fits their needs and upgrade their system as their incomes grow with added productivity as well as energy savings. The largest size generates

sufficient energy to support significant phone charging as an entrepreneurial activity. Combined with the savings on traditional sources and increased income, entrepreneurs particularly find larger systems attractive.

Fenix's value proposition is delivered through the business model components discussed in detail in the following sections, including products and pricing structure, sales, marketing, distribution, and after-sales service.

---

## Products and Pricing

---

Figure 3 shows Fenix's different sized solar systems, components, and prices of each as currently sold in Uganda. Fenix customers have the flexibility to make payments as frequently as daily to

match their cash flow. The company's product design is done in-house and manufacturing takes place in China.

FIGURE 3

Fenix Products and Prices in Uganda<sup>14</sup>

System size	Components	Deposit (includes 7 days credit)	Daily Instalments	Monthly Instalments	Total Price <sup>15</sup>
10W ReadyPay Home Starter Kit	3 Ultra bright LED lights Phone charging cable 10W solar panel Typical use: Daily use of up to 3 lights for 4 hours + charge 2 phones	UGX 40,000 (USD 14.61)	UGX 1,000 (USD 0.37)	UGX 30,000 (USD 10.95)	UGX 580,000 (USD 211.79)
10W ReadyPay Home Plus Kit	3 Ultra bright LED lights Battery clip charger Phone charging cable with multiple tips Radio with built-in torch 10W solar panel Nokia big pin charging cable Typical use: Daily use of up to 3 lights for 4 hours + 5 hours of radio + charge 2 phones	UGX 60,000 (USD 21.91)	UGX 1,100 (USD 0.40)	UGX 33,000 (USD 12.05)	UGX 654,000 (USD 238.81)
17W ReadyPay Home Comfort Kit	4 Ultra bright LED lights Squid multiple tip phone charging cable Radio 17W Solar Panel Typical use: Daily use of up to 4 lights for 6 hours + 5 hours of radio + charge 2 phones	UGX 85,000 (USD 31.04)	UGX 1,350 (USD 0.49)	UGX 40,500 (USD 14.79)	UGX 814,000 (USD 297.23)
34W ReadyPay Business Pro Kit	3 Ultra bright LED lights 2 squid multiple tip phone charging cables 2 x 17W solar panels Typical use: Daily use of up to 20 phones in a day + 2 lights for 6 hours	UGX 105,000 (USD 38.34)	UGX 1,500 (USD 0.55)	UGX 45,000 (USD 16.43)	UGX 915,000 (USD 334.11)
34W ReadyPay TV Kit	Ultra bright LED light Multiple tip phone charging cable 1 5 LED TV 2 x 17W solar panels Typical use: Daily use of up to 5 hours daytime TV + 4 hours light + 1 phone charge	UGX 200,000 (USD 73.03)	UGX 3,900 (USD 1.42)	UGX 117,000 (USD 42.72)	UGX 2,306,000 (USD 842.04)

14. Prices in UGX converted to USD using an exchange rate of UGX 1 = USD 0.00036515, the average exchange rate for December 2014 obtained from the OANDA Online Currency Converter.

15. Calculated by multiplying the financing term in months with monthly instalments and adding deposit amount.

Noteworthy changes to Fenix’s product line during the grant period were as follows:

- In October 2014, the Home Plus kit was introduced to give customers a system that could power a radio at a slightly lower price than previously possible.
- Simultaneously, to keep the number of variants to a manageable level, Fenix discontinued its least popular model, the 15W Business Starter kit which could support a small phone charging business (up to 10 phones per day).

- 15W panels were replaced with 17W panels in the Home Comfort, Business Pro and TV kits. Accessories were also upgraded. For example, the radio now has a built-in torch.
- The Business Pro kit was upgraded from one light to three lights, as lighting was found to be the application most valued by customers, even in a business context.

Source: Fenix International



ReadyPay Home Comfort kit



Fenix Packaging

## Use of Mobile: Technology and Partnership

**Technology:** At the core of Fenix’s pay-as-you-go service is the mobile money and payment tracking capability integrated into ReadyPay Solar. The payment process is illustrated in Figure 4 and described below:

1. The customer pays by dialling the MTN USSD<sup>16</sup> short code for mobile money services and selecting bill pay. She selects ReadyPay Solar, enters her customer account number and payment amount via USSD. The bill payment<sup>17</sup> menu is shown in Figure 5.
2. MTN credits the payment to Fenix’s merchant account. Further, MTN sends the payment amount and customer account number to Fenix’s server.
3. Fenix’s server generates an encrypted code based on the payment amount, the customer’s system type and system ID and returns it to MTN.
4. MTN sends this code to the customer’s mobile phone over SMS.
5. The customer enters the code into the ReadyPay Solar system using a wireless keypad. The system translates the code and unlocks itself for the appropriate number of days. Thus, the payment process for the ReadyPay Solar is an example of human-assisted<sup>18</sup> PAYG.

16. USSD: Unstructured Supplementary Services Data is an interactive channel between a mobile phone and an application on the mobile network.

17. Bill payment is a payment made by a person from either their mobile money account or over-the-counter to a biller or a billing organisation via a mobile money platform in exchange for services provided.

18. Predicting the Future of Mobile-Enabled Community Services - MECS Annual Report [http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/05/GSMA\\_MECS\\_Annual-Report-2013.pdf](http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/05/GSMA_MECS_Annual-Report-2013.pdf)

To ensure a seamless customer experience from making a payment to receiving the code, the customer payment must be reflected in Fenix's MTN Mobile

Money merchant account and its servers in real time. This immediate response is achieved through tight integration of the Fenix and MTN backend systems.

Previously, users needed the MTN Mobile Money SIM toolkit to make payments to Fenix. Users who did not have the toolkit on their SIMs needed to obtain a new SIM to make payments. This imposed the cost of acquiring a new SIM on customers as well as requiring a huge distribution exercise from MTN. More importantly, the requirement of a new SIM introduced a barrier in the customer's mind that made buying ReadyPay Solar that much more complicated. In September 2014, MTN upgraded its mobile money system and made available a Fenix bill pay option on its USSD menu. Now any MTN customer can make a ReadyPay payment regardless of the capability of his or her SIM.



FIGURE 4

### Fenix pay-as-you-go process

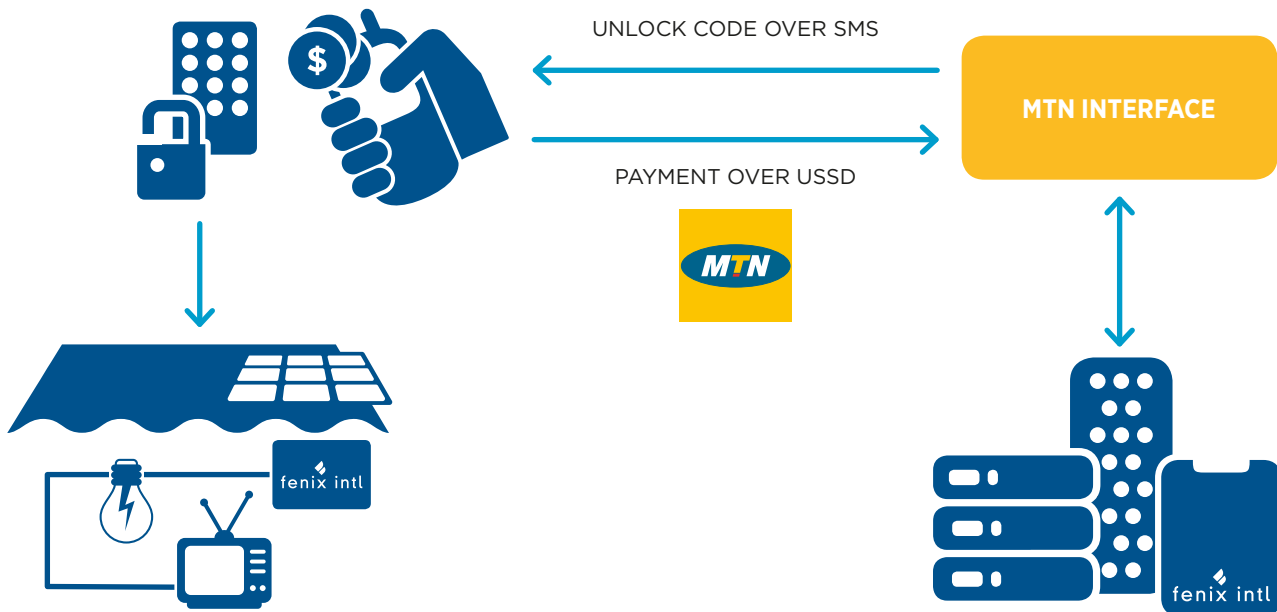
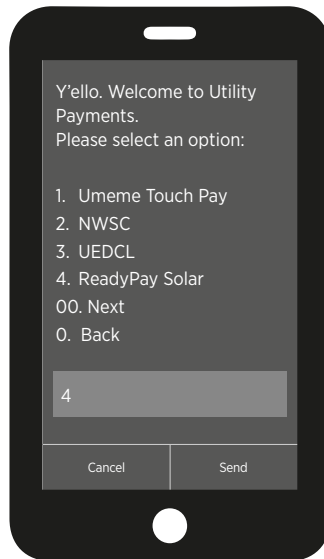


FIGURE 5

## MTN Money bill payment menu



**Partnership with Mobile Operator:** The Fenix-MTN Uganda partnership was formalised in 2011 with the launch of the ReadySet. However, it was in 2014, that the partnership became even more valuable to MTN with the rapid uptake of ReadyPay Solar.

MTN Uganda provides bill payment through mobile money, favourable connectivity rates to Fenix, call centre

technology as well as access to its brick and mortar sales channel including dealer sales staff and points of sale. However, the most valuable asset that MTN shares exclusively with Fenix is its brand. To reinforce the brand association, the ReadyPay Solar system is co-branded with both MTN and Fenix's logo and the plastic casing is exactly matched to the official MTN brand colour.

"People perceive MTN as a strong, authentic brand. They associate MTN with quality. In a market that has been abused by cheap, low quality products, the MTN brand provides Fenix with more acceptance than if we were selling on our own. Whenever we show up in an MTN van, a crowd assembles and we have an audience to talk to about Fenix.

MTN also benefits from its association with Fenix. We have had many people say that MTN cares for them because it goes beyond the normal practice of pushing airtime and connections. It solves a critical need by bringing them safe and affordable energy."

**Calvin Kaumi, National Sales Manager for Fenix**

Potential benefits to MTN include the following, which are discussed in the results section:

- New subscriber acquisition via the exclusive Fenix ReadyPay lease-to-own solar offering
- New subscriber revenue generation from fees on mobile money energy payments
- Increased subscriber use of mobile money for other transactions
- Increased subscriber use of voice, SMS, data and other value added services by virtue of having their phones powered and on-network
- Brand loyalty and stickiness due to the regular and frequent use of the MTN mobile wallet

An example of Fenix's strengthening partnership with MTN is encapsulated in the way they coordinated their efforts when MTN upgraded its mobile money system. This upgrade required that MTN Mobile Money be brought down for a week and could have disrupted Fenix's sales and payment collection. The partners coordinated closely to ensure minimal impact on customers. As MTN advertised the shutdown across the country, Fenix took the following steps:



Paused sales during the outage

Sent out multiple communications in the week leading up to inform its existing customers

Ran a promotion to incentivise customers to purchase larger bundles of energy so they would have power through the planned outage

If a customer called to complain about being locked out during the outage, Fenix issued an advance and unlocked the system. The advance was adjusted against the next payment

As soon as MTN Mobile Money came back online, Fenix began educating customers about the new option to pay over USSD

Updated the payment instructions in the sales kit and automated SMS reminder for customers whose payments were upcoming.

## Marketing, Sales, Distribution and Customer Service

Beyond product and pricing, Fenix's success depends on careful attention to the key business components of marketing, sales, distribution and customer service. Figure 6 describes Fenix's operations within these business components in Uganda. These were initially developed in Uganda, trialed in Tanzania, and refined for the Ugandan market with the launch of the ReadyPay.

FIGURE 6

## Description of Fenix Operations for Core Business Components

Business Component	Structure & Strategies
Marketing	<p>Above the Line:</p> <ul style="list-style-type: none"> <li>• Radio advertisements and live talks</li> <li>• Billboards and print</li> </ul> <p>Below the Line:</p> <ul style="list-style-type: none"> <li>• Strong branding of points of sale, field staff, and store paintings</li> <li>• Sales events at market hubs and other community gatherings</li> <li>• Other BTL deliverables such as posters, flyers, danglers etc.</li> </ul>
Sales	<p>Sales force structure:</p> <ul style="list-style-type: none"> <li>• Two types of sales staff: Fenix employees (managers) and MTN or MTN dealer sales agents (field staff)</li> <li>• Both compensated with a mix of salary and commission</li> </ul> <p>Purchase:</p> <ul style="list-style-type: none"> <li>• Customers responsible to transport system home</li> <li>• Installation is straightforward and can be assisted by customer service over the phone</li> <li>• Activation is assisted together by sales staff (in person) and customer service staff (over the phone)</li> <li>• If a customer does not have an MTN mobile money account, sales staff will open a new account for the customer at the time of purchase. They also teach the customer how to use mobile money and make payments independently.</li> </ul> <p>Promotions:</p> <ul style="list-style-type: none"> <li>• Strong customer referral programme means over 50% of new customers are referees</li> <li>• Collateral such as T-shirts and sunglasses for special customers are a valuable incentive. They also keep Fenix visible in the community and help the Fenix sales team</li> </ul> <p>Upgrades:</p> <ul style="list-style-type: none"> <li>• Modularity of systems allows for easy upgrades and addition of appliances throughout customer relationship so long as customer has a good repayment record.</li> </ul> <p>Points of sale:</p> <ul style="list-style-type: none"> <li>• MTN shops</li> <li>• Roving sales events at marketplaces and other community meeting points</li> <li>• Walk-in at Fenix office</li> </ul>
Distribution	<p>Three distribution levels:</p> <ul style="list-style-type: none"> <li>• National headquarters in Kampala</li> <li>• Regional hubs at large MTN dealer locations</li> <li>• Local points of sale at small MTN shops in towns</li> </ul>



Service	<p>Fenix to customer calls:</p> <ul style="list-style-type: none"> <li>• Regular check-in calls made to customers to gauge satisfaction and proactively troubleshoot issues.</li> <li>• Customer service representatives trained to help customer make payment with MTN Mobile Money account</li> </ul> <p>Customer to Fenix calls for support:</p> <ul style="list-style-type: none"> <li>• Toll-free customer care number prominently displayed on box and unit</li> <li>• Growing customer communication team operated in three shifts during waking hours</li> <li>• Multilingual capability to speak most popular of Uganda's 41 languages</li> <li>• Establishing regional service centres for faster response times</li> </ul> <p>Fenix database:</p> <ul style="list-style-type: none"> <li>• Database with integrated purchase information and payment history with customer service records so customer service representative has information handy when customer calls</li> <li>• Voice calls analysed to find common threads in customer issues</li> </ul>
---------	---

Source: Fenix International



Sales event at weekly market hub

# Early Results

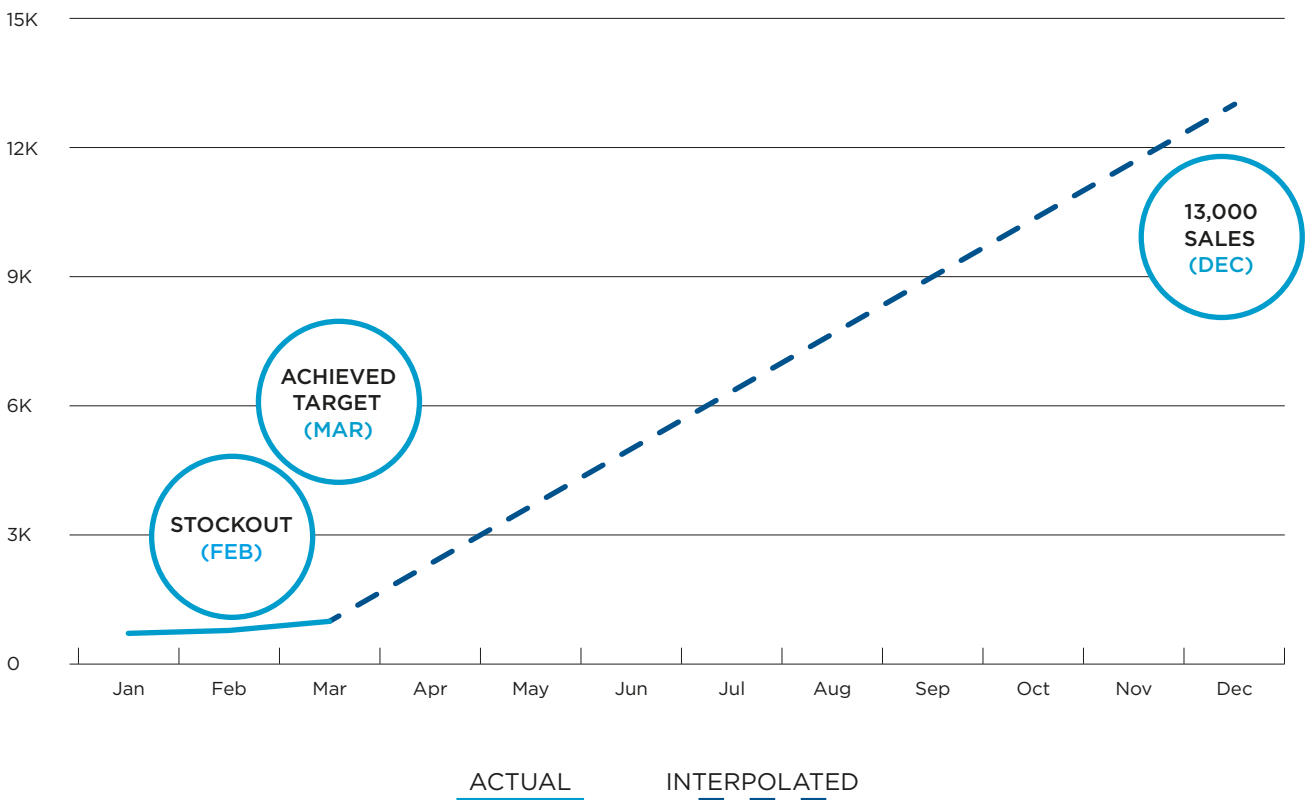
## Business Model Viability

Within the first three months of the grant, Fenix reached their target of 1,000 systems in customers' hands. A sixth (16.6%) of the first 1,000 systems were purchased by women. The sales progression is indicated in Figure 7 below.

**PAYG gave strong impetus to sales with 13,000 systems being sold in 2014:** Customer demand for the ReadyPay Solar exceeded Fenix's most optimistic projections.<sup>19</sup> As a result, Fenix experienced a brief stock outage in February after more than 700 systems were sold in January and achieved the 1,000 system target in March. By December 2014, Fenix had sold over 13,000 ReadyPay Solar systems in Uganda.

**FIGURE 7** Source: Fenix International

### Fenix Sales Progression and Key Developments in 2014



<sup>19</sup> Fenix had projected 14,400 sales by May 2015 when the project began.

**Sales were dominated by 10W and 15W kits; Lighting was the most important application followed by radio:**

Based on the first 1,000 sales,<sup>20</sup> the 10W and 15W Home kits (later updated to be 17W) comprised the vast majority of the kits sold. Lighting was found to be the most popular application. Radios proved to be a very popular accessory with over 40% of kits being sold with radios. Anecdotal and early sales evidence suggests that television sets may be an important application, however, insufficient low-cost efficient televisions were available in 2014 to test the market demand for televisions at scale.

**Tampering and defaults were a small percentage of systems sold:** Tampering with the system to bypass the payment tracking mechanism is a potential threat to all PAYG providers. In Fenix's case, only four of the first 1,000 customers attempted to tamper with the system, and 20 systems were returned because buyers could not keep up with payments.

**Repossessing systems from defaulters**

Repossessing a system due to default on payments can be seen as a David versus Goliath scenario and create a negative reaction within a community. However, repossessions are an important signal to customers that their payment obligations are real. Fenix devised a cost-effective and compassionate method of recovering assets by offering defaulting customers their deposit back if they voluntarily return a unit. This is a win-win because Fenix does not incur high costs of collections, the customer receives their deposit and Fenix is able to refurbish and redeploy the asset.

**Repayments are healthy but there is no standard definition of repayment rate for variable frequency PAYG**

**yet:** While sales are important, healthy repayment rates<sup>21</sup> are equally so. As the company was just beginning to sell systems on credit, and so did not have refined ability to evaluate creditworthiness, Fenix set cautiously realistic targets for a repayment rate, and designed their business model accordingly.

Through the first 15 months of ReadyPay Solar sales, Fenix has been excited to see healthy portfolio-wide repayment. The company has refined its ability to collect customer information, vet customers and evaluate creditworthiness at the time of sale, and experimented with various after sales communication and incentive techniques to encourage customer payback. This has helped keep portfolio wide repayment in a steady and healthy window.

As the PAYG industry is still young, uniform definitions of repayment rate, default rate, portfolio health, etc. have not been agreed upon. Accordingly, Fenix has continued to experiment and monitor multiple different metrics to maximise learning. Some of these metrics include portfolio at risk<sup>22</sup> (PaR 30, PaR 90), monthly ARPU,<sup>23</sup> and percentage of received over expected payments. Fenix looks forward to industry standardisation of metrics and definitions.

20. The product mix still had the Business Starter Kit but not the Home Plus Kit. The panel sizes for the larger systems were still 15W/30W.

21. There is no universal definition of repayment rate. In general, organizations tend to define it as the fraction of customers who are expected to fully pay back within a period that is somewhat longer than the loan term.

22. CGAP defines Portfolio at Risk (PaR) as the value of all loans outstanding that have one or more instalments of principal past due more than a certain number of days. This item includes the entire unpaid principal balance, including both past-due and future instalments, but not accrued interest. It also does not include loans that have been restructured or rescheduled.

23. Average receipts (cash) per user.

# Refinements to Operations

Apart from the changes to its product mix described earlier, Fenix made key changes to its processes as it strives to create and meet customer demand.

## Customer service

**Opened regional service centres:** As Fenix's geographical footprint expands, the time to return devices to the central service centre is increasing significantly. This problem is compounded by the poor road infrastructure in remote areas. As a result, Fenix is opening regional service centres in order to continue to deliver an exceptional customer experience as they grow.

**Improved customer service with freshly graduated, multi-lingual customer service representatives:** There are more than 40 languages in Uganda. Fenix requires each customer service representative to be at least trilingual so customers can find support in their native language. Further, most trained call centre operatives have ingrained practices and do not measure up to Fenix's high standards and processes. So Fenix hires fresh university graduates as representatives and provides in-house training to deliver an exceptional experience to its customers.

**Reinforced customer trust by managing customer expectations during outages:** Stronger than forecasted January sales resulted in a brief stock out in February 2014. During this time, Fenix strategically managed geographic expansion to ensure that all points of sale could be adequately supported. Moreover, Fenix realistically managed customer expectations of delivery time. Thus, Fenix successfully managed and fulfilled customer expectations to ensure that people retained their trust in Fenix's capability to deliver. At the same time, Fenix created lead lists of customers to follow up with once inventory became available again and achieved its 1,000 unit sales target ahead of schedule in March 2014.

Fenix worked closely with MTN to minimise the impact of the week-long planned outage of MTN Mobile Money through proactive customer communication. As a last measure, Fenix gave advances that were adjusted against the next payment to bridge the down time.

## Sales

**Designed incentives to balance sales targets with repayment rate targets:** While sales are an important metric, healthy repayment numbers are important to a sustainable PAYG model. Fenix continues to adjust incentives for both sales and customer service representatives to prioritise choosing good customers. Fenix conducts thorough training and capacity building of sales and customer service representatives so they understand and implement the balance between sales and repayment.

## Marketing

**Co-branding and marketing with MTN creates strong trust levels:** Before Fenix launched ReadyPay Solar, solar was often viewed suspiciously in Uganda due to sub-par quality products and unethical practices by other vendors. Co-branding and marketing with MTN proved critical in establishing customer trust in these market conditions.

**Innovative and low cost marketing channels are more effective to reach Fenix's target segments than expensive ATL (above the line) campaigns:** To create demand for ReadyPay Solar, Fenix first introduced the ReadyPay Solar system at weekly marketplaces and community gatherings.

While the offer of financed purchase clearly energised demand, community leaders (and even acquaintances) who bought ReadyPay Solar and became Fenix ambassadors were instrumental in converting interest to sales. Thus, word-of-mouth has proven to be an extremely effective channel to drive sales.

In Fenix's experience, radio has proven to be a far more effective marketing channel than billboard or print media.

Finally, Fenix gives out branded merchandise such as T-shirts and sunglasses as rewards and to keep ReadyPay Solar visible in communities beyond the visits by sales staff. These items are very popular but Fenix has to control their distribution to control cost and to retain their association with an aspirational product.

## Customer Benefits

**ReadyPay Solar largely replaces unhealthy sources of lighting with only 31% of customers needing to turn to alternate sources of energy:** Fenix's customers largely used poor quality and unhealthy sources for lighting prior to purchasing ReadyPay Solar. Of the 70 of 1,000 customers surveyed for lighting sources,<sup>24</sup> 10% used candles, 66% used kerosene, 13% had intermittent grid access, 7% had other solar systems and 14% used batteries. The most popular sources of phone charging were a grid powered service or a kiosk. After purchasing the ReadyPay Solar, customers using kerosene dropped significantly, from 66% to 10%. Customers using batteries dropped from 14% to 6% and those using candles dropped from 10% to 4%. These responses are strongly indicative of a shift away from unhealthy sources of lighting, but the shift was not complete. This could be driven by a number of factors, such as the use of existing radios or torches that require dry cell batteries.

**All systems have capacity to offer some income generation:** Although the vast majority of customers purchased the Home versions of ReadyPay Solar, many used their solar systems to offer phone charging services to clients. Of the 70 respondents, 17% purchasers of the Home kits said they earned income from phone charging. The price per phone charge was

either UGX 300 or UGX 500 (USD 0.11 or USD 0.18) with an average of 4.9 phones charged daily.

**High customer satisfaction results in nearly half of new sales being through customer referrals:** Fenix scored very high on customer satisfaction with 97% respondents reporting high or very high satisfaction. Moreover, 97% respondents were willing to recommend or have already recommended ReadyPay Solar. Word-of-mouth from satisfied customers is propelling Fenix's growth. At the time of writing this Case Study, over 50% of Fenix's new customers are from referrals.

**Other notable customer benefits as per the customer survey are:**

- Customers use ReadyPay Solar lights on average six hours per night.
- 84% of customers find ReadyPay Solar affordable or very affordable.
- 80% of customers report saving more money thanks to ReadyPay Solar.
- On average, children study an additional 1.6 hours per night.

Source: Fenix International



Fenix customers

24. Respondents were allowed to specify multiple sources

## Mobile Industry Benefits

**ReadyPay Solar is the third largest account in terms of bill pay transactions on MTN Mobile Money:** Fenix's customers pay for ReadyPay Solar using MTN Mobile Money. In 2014, they made over 100,000 payments from which MTN earned revenue through transaction fees. This made Fenix the third largest account in terms of number of bill pay transactions on MTN Mobile Money in Uganda. But the benefit to MTN goes well beyond direct revenue.

**ReadyPay Solar keeps MTN Mobile Money accounts active by creating a need, providing training to customers and providing reoccurring reason to use their mobile money accounts:** As is well accepted in the mobile money industry, subscribers who have performed a mobile money transaction in the past 90 days are considered active subscribers. MTN also tracks subscribers who have performed a transaction in the past 30 days and denotes such subscribers as RGS30.<sup>25</sup> Most of Fenix's customers are classified as RGS30 because they typically make multiple payments each month.

Further, MTN has found that there are two hurdles for mobile money adoption:

- People do not need it
- People do not know how to use it

The ReadyPay Solar naturally solves the first problem by providing subscribers with a regular use for mobile money. When a ReadyPay Solar customer does not have MTN Mobile Money, an account is created for her. Fenix also addresses the second hurdle by employing personnel that teach customers how to use mobile money to make the first (down) payment. When the energy credits are nearly consumed, Fenix follows up

with a combination of SMS and calls to remind and assist the customer. If necessary, a Fenix Customer Service Representative walks the customer through the payment process again.

**Fenix ReadyPay customers use mobile money more frequently for other transactions as well:** MTN believes that Fenix's customers are more active in their use of mobile money for purposes other than making ReadyPay payments.

**Other notable highlights regarding the use of mobile from the customer survey are as follows:**

- The average customer household has 3.5 adults and 4 children. The average number of phones is 2.9.
- Airtime purchase bundles ranged from UGX 200 to UGX 18,000. Over 70% reported buying airtime in either UGX 2,000 or UGX 1,000 bundles.
- Nearly half those surveyed reported buying airtime every 1-2 days while about a sixth bought it weekly.
- 13% of ReadyPay Solar customers were previously not MTN Mobile Money customers. This is indicative of ReadyPay Solar's potential to increase the penetration of MTN Mobile Money.
- Nearly 80% of ReadyPay Solar customers find making payments easy or very easy. The same proportion makes payment on its own as opposed to seeking help from an agent, a friend, a Fenix employee, etc.
- 70% of those surveyed said their impression of MTN has improved significantly with the association with ReadyPay Solar.

<sup>25</sup>. Revenue Generating Subscriber in past 30 days

# Conclusions

A Market Validation grant was awarded to Fenix to scale up its mobile-enabled energy business in Uganda through a partnership with MTN Uganda. Over 2014 Fenix has successfully scaled the business by selling 13,000 ReadyPay Solar systems at a faster rate than they had projected. The high demand for mobile payment enabled solar exceeded Fenix's expectations leading to a short stock outage. However, Fenix successfully managed customer expectations and sales remained strong throughout the year.

There were some mobile money network outages especially in the beginning of the project which Fenix was able to work around. A week-long planned network outage while MTN upgraded its backend was smoothly handled by MTN and Fenix working together to set and manage customer expectations throughout this upgrade. Following the upgrade, the mobile money system was enhanced and the network became very stable.

During the project, Fenix learned which marketing channels were most effective in reaching its target customers. While radio was found to be the most effective broadcast medium, branded collateral such as T-shirts and sunglasses were found to be very effective in keeping interest in ReadyPay Solar active in the communities that Fenix serves. Word-of-mouth is a channel through which interest can be converted to sales.

Fenix and MTN's partnership is mutually beneficial. For Fenix, the association with the MTN brand is instrumental in engendering trust and creating pull. MTN also provides Fenix with a capital efficient and rapidly scalable sales channel in Uganda as well as the opportunity to expand into new markets. For MTN, ReadyPay Solar creates a need for an MTN Mobile Money account as well as the incentive to use it. Not only does this result in increased transactions directly attributable to ReadyPay Solar, it also makes customers more comfortable with MTN Mobile Money and results in higher usage for other transactions.

Fenix's customer surveys clearly indicate the benefits of ReadyPay Solar in terms of better quality and healthier lighting, increased hours of study, phone charging, time saved, etc. The vast majority of customers surveyed said they found the ReadyPay Solar affordable or very affordable. Fenix's customers not only state that they value ReadyPay Solar, they refer others in large numbers. Over 50% of sales are through customer referrals.

Fenix has accomplished a lot with GSMA's support. Further, With USD 12.6 million in Series B investment and working capital following the GSMA grant, Fenix has rapidly increased sales and deepened its partnership with MTN Uganda, all while delivering affordable energy access to base of the pyramid customers.

---

## Appendix: Case Study Methodology

---

**Overview:** This case study is based on learnings that emerged throughout Fenix's Market Validation grant through the Mobile for Development Utilities programme. These were tracked through the following:

**Grantee reporting:** Monthly reports were completed on activities, project risks and mitigation, and key performance indicators. These were discussed during a one-hour call with the grant manager each month. Quarterly reports were completed to document progress on milestones, the grantee's learning objectives, barriers and other key project developments as well as financial compliance.

**Customer Surveys:** Fenix carried out an endline survey as part of this project. The survey was conducted on October 12-22, 2014 and interviews of the 70 participants were carried out over the phone.

**Limitations of this study:** The study aims to provide only the key learnings from Fenix's grant and cannot possibly cover all the day-to-day learnings from Fenix. It also aims to share learnings with the broader sector without releasing commercially sensitive data from Fenix or MTN Uganda.

The customer surveys are meant to be representative while not necessarily statistically significant to a specified degree of certainty. Customer surveys are known to have limitations in accuracy, particularly around expenditures, income and previously carried out activities, where people often fail to recall these correctly or are influenced by perverse incentives (e.g. stating a lower income than reality thinking it will reduce the future pricing).





For more information on the Mobile for  
Development Utilities programme visit:  
[www.gsma.com/mobilefordevelopment](http://www.gsma.com/mobilefordevelopment)

**GSMA HEAD OFFICE**

Floor 2  
The Walbrook Building  
25 Walbrook  
London EC4N 8AF  
United Kingdom  
Tel: +44 (0)20 7356 0600  
Fax: +44 (0)20 7356 0601

