



d.light and RE-VOLT: Pay-as-you-go solar service driving mobile money adoption in Haiti



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The **Mobile for Development Utilities Programme** improves access to basic energy, water and sanitation services in underserved communities using mobile technology and infrastructure. Our work encompasses any energy, water and sanitation service provided to a community, which includes a mobile component, whether it is voice, SMS, USSD, Machine-to-Machine, NFC, a mobile operator's agent network or tower infrastructure. We aim to seize the opportunity, leveraging mobile technology and infrastructure to enhance access to affordable and reliable energy, clean and safe water and sanitation services in underserved communities. The GSMA Mobile for Development Utilities Programme receives support from the UK Government.

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www.dlight.com

d.light provides affordable distributed solar energy solutions for households and small businesses that are transforming the way people all over the world use and pay for energy. Through four hubs in Africa, China, South Asia and the United States, d.light has sold over 20 million solar light and power products in 65 countries, improving the lives of over 80 million people. d.light is dedicated to providing the most reliable, affordable and accessible solar lighting and power systems for the developing world and reaching 100 million people by 2020.



www.re-volt.com

RE-VOLT is a social enterprise that provides clean, affordable light and power to rural Haitian families by leasing single-home solar energy systems to its customers. These systems include a solar panel, a battery unit with USB power outlet, and several lights. Their locally-based sales and service team personally installs these systems in new customers' homes, and immediately fixes or replaces systems that experience any technical issues. Rather than paying the full cost of the product upfront, customers pay a down payment and a low monthly fee via mobile money.

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d.light and RE-VOLT

GSMA Mobile for Development Utilities Market Validation grant, 2015-2017

Pay-as-you-go solar service driving mobile money adoption in Haiti.

7 AFFORDABLE AND
CLEAN ENERGY



USE OF MOBILE



Mobile Payments
Mobile Money



M2M
connectivity

RE-VOLT launched its lease-to-own solar home systems in partnership with d.light as the product supplier, while RE-VOLT provided the marketing, distribution, training, customer education, credit check and after-sales service, and managed the relationship with Digicel, the largest mobile operator in Haiti. The service used machine-to-machine (M2M) connectivity to monitor and control energy usage, and Digicel's Mon Cash mobile money service enabled customers to make remote payments for their energy use.

During the grant period, d.light products improved energy access for 12,440 people and resulted in savings of \$646,600 in energy-related expenditure for the beneficiaries.*

PROJECT OUTCOMES

1.8x



growth in solar home system sales in just over a year.

43%



of RE-VOLT customers were new mobile money users.



ARPU of RE-VOLT customers increased by **20%** after buying the solar home system.

KEY PROJECT LESSONS



It takes some trial and error to find the right pricing model for each market.



PAYG services can drive mobile money adoption in greenfield markets, but low digital literacy requires customer education and training from mobile money agents.



For the same product, the purchase decision can be affected by different factors in different markets. It is important to tailor the offering and marketing activities based on customer needs.

*Calculations based on Global Off-Grid Lighting Association (GOGLA) metrics



Overview of the project

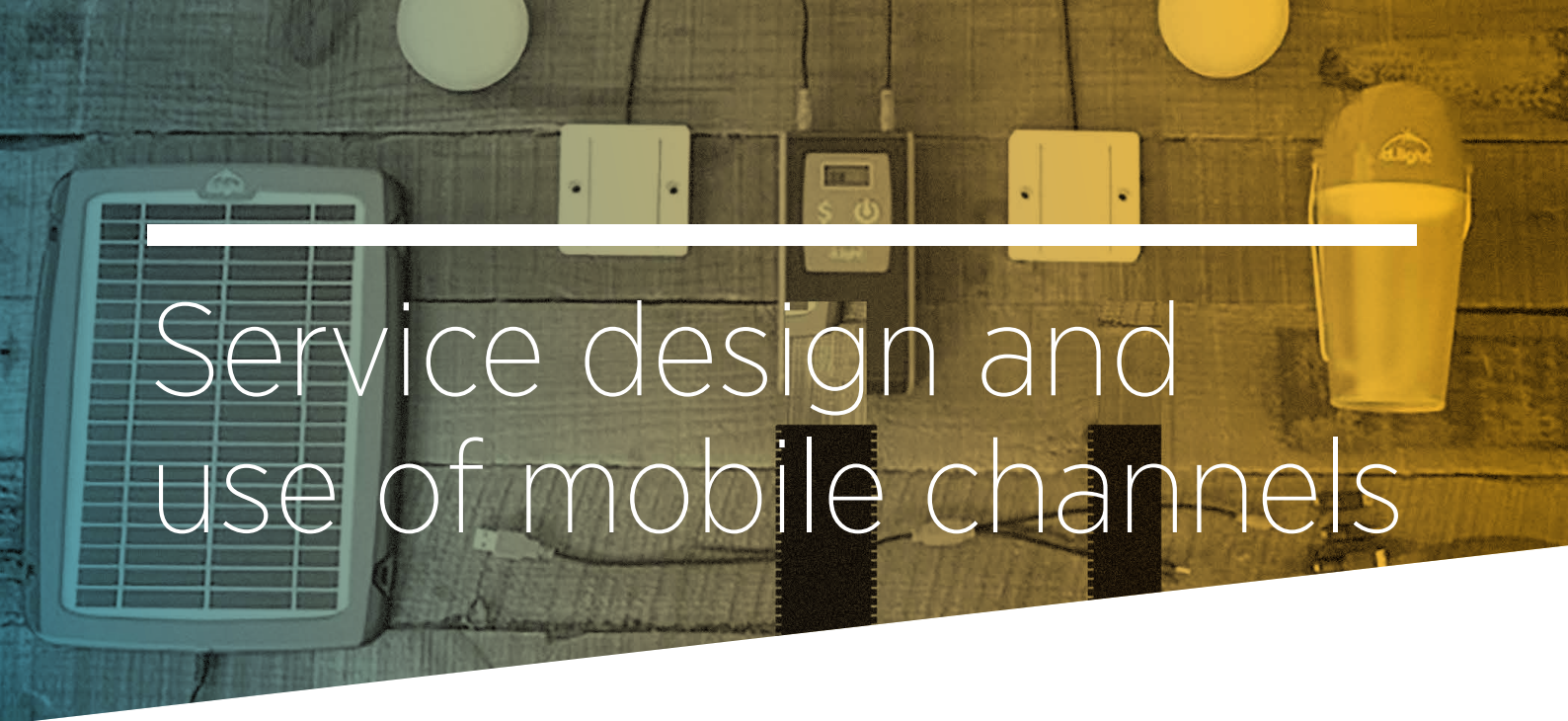
In December 2015, the GSMA Mobile for Development (M4D) Utilities programme awarded an 18-month grant to d.light, in partnership with RE-VOLT and Digicel, to scale up a lease-to-own energy model in Haiti through the distribution of pay-as-you-go (PAYG), M2M-enabled solar home systems (SHS), and to test the impact of PAYG solar on mobile money adoption in areas with low mobile money penetration.

d.light provides solar-powered solutions for people without access to reliable electricity. At the time of the grant, d.light had recently introduced their own PAYG SHS—the D30—a 10W SHS that included a solar panel, mobile-charging battery pack, three solar lights, three light switches, a torch and FM radio. In the partnership, RE-VOLT, as the product distributor, provided the marketing, distribution, training, customer education, and credit checks and after-sales service. RE-VOLT is a Haitian company, founded by two senior Digicel Haiti executives and Digicel is the largest mobile operator in the country with 71 per cent market share of subscribers.¹

The objectives of the grant were to answer the following questions as follows:

1. Does providing a use case for mobile money drive adoption and active mobile money use?
2. Would increased mobile money adoption and use allow for the proliferation of other services in Haiti that rely on mobile money?
3. How does this product and service create a proof point for PAYG solar expansion in other markets with low mobile money penetration?
4. Are customers in Haiti interested in a PAYG solar model and are they able to pay the tariff?

1. GSMA Intelligence



Service design and use of mobile channels

RE-VOLT offers a lease-to-own² 10W SHS with three lights, a torch and a radio for a down payment of \$20 to customers in Haiti. RE-VOLT distributes d.light products and registers customers with a Digicel Mon Cash mobile money account at the time of registration. Customers can purchase pre-paid electricity in daily, weekly or monthly increments using mobile money and have their account credited remotely through an embedded SIM card in the home solar system that uses machine-to-machine (M2M) technology.

d.light also provides the backend platform for the SHS that includes:

- A payment handler that allows RE-VOLT to accept mobile money payments and reconcile them against a customer's account;
- An M2M communications module that allows the d.light product to communicate with the units once a day and gather information about battery health, energy generated by the panel and energy used by the customer, as well as update the credit remaining on the unit;
- An inventory tracker that allows RE-VOLT to determine stock levels at all points of sale; and
- A customer support dashboard that allows RE-VOLT's call center representatives to diagnose technical issues, send updates to units and track customer usage. A management reporting dashboard generates reports on desired KPIs.

2. In the lease-to-own model, customer payments go towards paying off the system, allowing customers to eventually own their SHS. They can also complete their payments ahead of the collection schedule.



Lessons from the project

1 | PAYG services can drive mobile money adoption in greenfield markets, but low digital literacy poses significant challenges

At the time of the grant, Haiti was still a nascent mobile money market, with seven per cent of the population subscribing to mobile money and three per cent actively using mobile money accounts (December 2015). At the end of the grant period (December 2017), this had risen to 16 per cent of the population subscribing to mobile money and eight per cent actively using mobile money accounts. Through this grant, we aimed to gauge the influence of PAYG utility services on driving mobile money adoption in ‘greenfield’ markets such as Haiti.

According to data collected by Digicel during the course of our grant, 43 per cent of RE-VOLT customers were new mobile money users. The average number of monthly mobile money transactions made by RE-VOLT customers was nearly five times more than those made by other mobile money users. Eighty per cent of RE-

VOLT customers had active solar home systems by the end of each month, suggesting that PAYG SHS not only spurred mobile money adoption, but also provided a use case for active mobile money use on a regular basis. Moreover, the introduction of a PAYG SHS increased Digicel’s ARPUs for its RE-VOLT customers by 20 per cent (from HTG 759 (\$12) to 913(\$14)), indicating that these systems can boost mobile revenues.

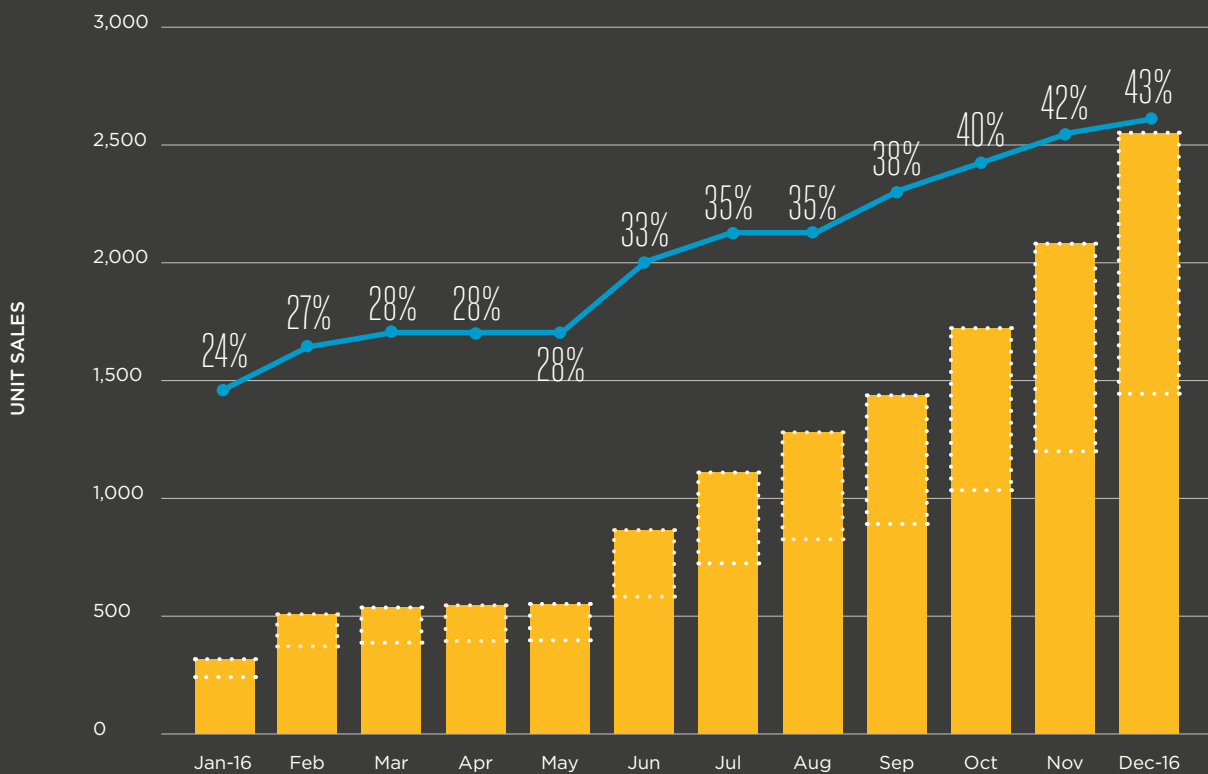
However, driving mobile money adoption was not easy, as 40 per cent of RE-VOLT’s customers were still paying mobile money agents in cash to make transactions on their behalf. Customers did not trust mobile money, did not know how to use it or were concerned they would make an error, which deterred them from transacting independently and realising the true value of mobile money: to spend less time and resources going to an agent.

3. GSMA M4D Utilities, December 2017, “[Going greenfield with utility pay-as-you-go models](#)”.

4. Based on results of a phone survey conducted by Acumen with 283 RE-VOLT Haiti customers. The study comprised baseline interviews with new customers and follow-up (endline) interviews with the same customers three to four months later.

FIGURE 1

RE-VOLT's PAYG SHS drove mobile money adoption among its customers in Haiti



Cumulative sales

• • •

Cumulative new mobile money accounts linked to sales

% new mobile money accounts

"I don't use [mobile money]. I hear people talking about it but I don't understand and never tried to get more information on it. I don't understand it and I am really not interested in it. I pay multiple months together at the store where the agent does it for me."

- MARIE GUERLANDE PASCAL, FEMALE USER

"The only thing that scares me with the MonCash is if I make a mistake when I enter the account number and would lose the money."

- LOUIS JEAN DENIZARD, MALE USER

2

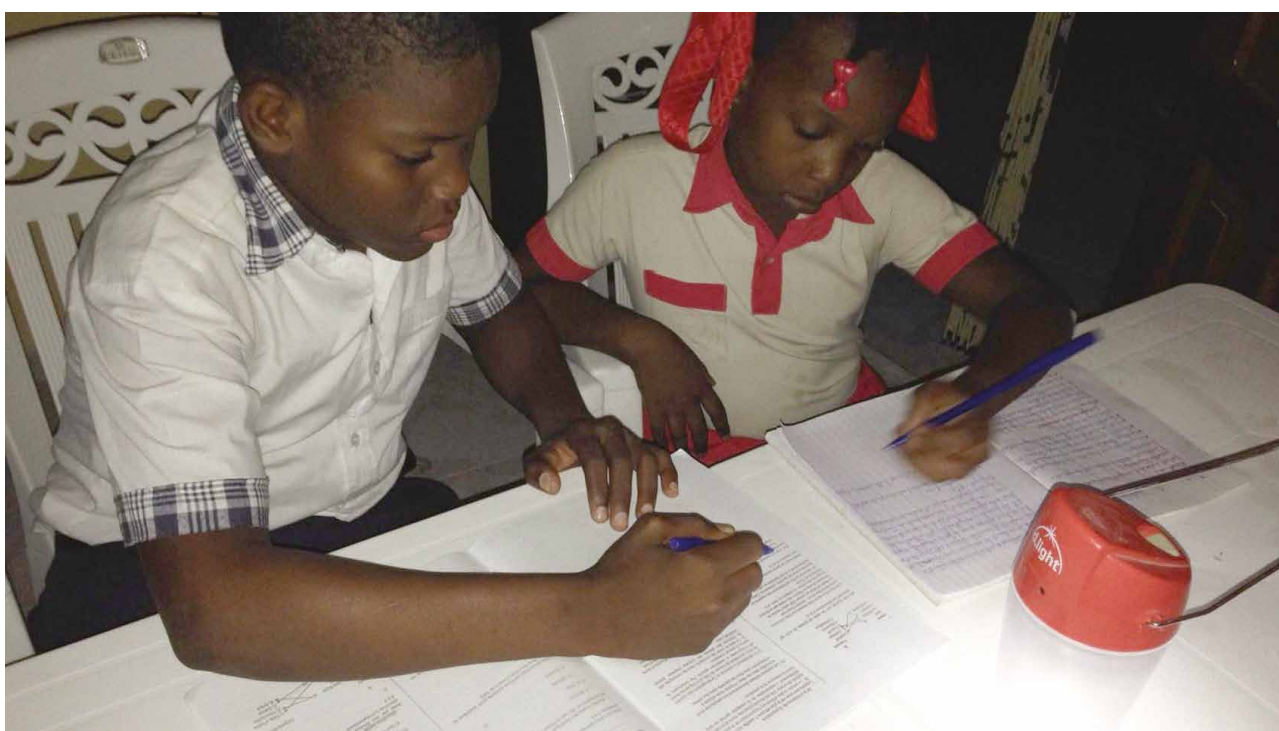
No two markets are the same – adaptability is key

To understand the nuances of replicating the PAYG SHS model in different countries, Acumen⁵ conducted a detailed customer survey⁶ in two of d.light's markets—Kenya and Haiti—where mobile money ecosystems are at different stages of maturity and customer awareness of mobile money also differs. The objective was to investigate the reasons potential customers decide against purchasing a d.light PAYG SHS. The survey found that 72 per cent of interviewed customers in Haiti had access to grid electricity (the target customer base for peri-urban customers), revealing that solar energy would be a supplementary source of energy to the grid and purchases were more likely to be influenced by service delivery and the price differential between grid and solar power. In Kenya, meanwhile, the target customers were rural and valued better energy service, brighter lighting and phone charging at home more than price.

There was a stark difference in awareness of PAYG SHS in Kenya and Haiti. While 100 per cent of interviewees in Kenya had heard of SHS, only 22 per cent in Haiti

had. However, 80 per cent of customers in Haiti who had used PAYG SHS for three months felt they could not easily find a good alternative. The main reason given for not signing up for PAYG SHS in both Haiti and Kenya was a lack of information in the radio or SMS campaign and/or the respondents had reached out to the service provider but had not heard back. While potential customers in Haiti may be most attracted by marketing messages about using the SHS as a complement or back-up to grid electricity, and which use language that attracts 'early adopters', for Kenyans, a more prominent product display or discussion of quality may be key to increasing uptake.

Thus, even with the same product and similar income groups, the purchase decisions of potential customers can differ significantly between countries. To drive adoption, it is important to market the products accordingly and conduct awareness campaigns that highlight the most valued aspects of the product in a particular market.



5. <https://acumen.org/>

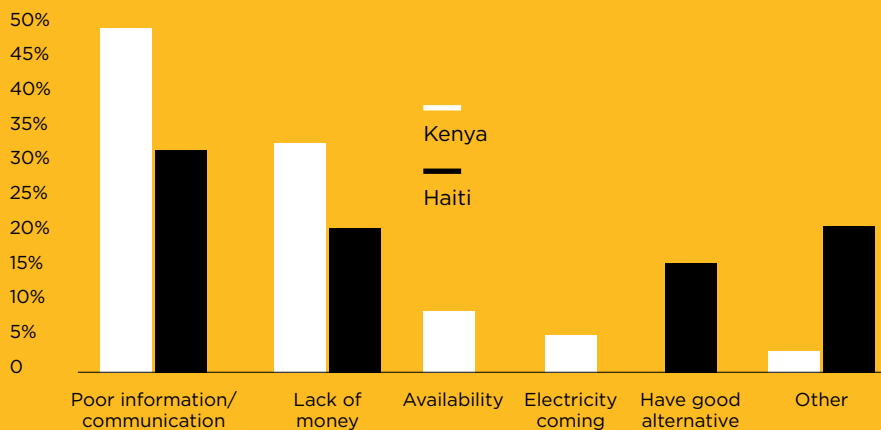
6. The study comprised phone interviews with contacts RE-VOLT had in Haiti who were sent an SMS describing a home system offering, and in Kenya with people who had responded to an SMS campaign on the radio. Acumen developed survey tools to collect data to identify the main reasons for slower uptake in Haiti than in Kenya, where sales were high.

FIGURE 2

Survey results of non-customers from Haiti and Kenya compared

REASONS FOR NOT SIGNING UP FOR THE PAYG SHS

The most common reason was because they did not feel they had enough information from the SMS/radio advert and/or they reached out via SMS and didn't received anything back.



“

My means don't allow me to buy it yet.

- Edson Domeus, Haiti

”

“



They took long to respond, then I wrote another SMS after three weeks but they did not respond.

- Jane Njoroge, Kenya

”

PURCHASE DECISIONS RANKED

The question asked was: Could you rank these in order of importance to you when considering a purchase like this, where 1 is most important?

 KENYA	 HAITI
Quality of product	Trust the company
1.6	2.3
Price	Price
1.6	2.9
Flexibility of payment	Quality of product
3.3	2.9
Know someone with one already	Know someone with one already
3.3	3.8
Trust the company/agent	Flexibility of payment
5.4	4.5
Customer care service	Customer care service
5.4	4.5

Source: Non-customer results from Acumen survey

3

Trial and error may be necessary when scaling in new markets

Prior to the grant, in March 2015, RE-VOLT conducted a small pilot of the SHS business model with 530 customers in Haiti. This was largely successful, with over 85 per cent usage and 97 per cent new mobile money subscribers. However, when launching the full-scale model, RE-VOLT had to experiment with a few different ownership and pricing models to arrive at an optimal, affordable, but still profitable offering for Haitian customers.

1. Switching from energy-as-a service model to a lease-to-own model

– RE-VOLT initially offered a perpetual lease model whereby the customer would pay a 1,000 Haitian gourde (HTG) or \$17 deposit and HTG 250 (\$4) per month to use the SHS, with a guarantee that the product would be replaced if it stopped working. RE-VOLT received numerous complaints and queries from customers about when they could own the system. There were also high levels of tampering by customers to avoid paying for the SHS. Moreover, the long customer payback periods led to massive capital requirements for the service providers to break even and achieve scale. Due to these issues, RE-VOLT decided three months into the grant period to transition to a two-year lease-to-own model.

2. Switching from a two-year to a one-year lease-to-own offering and changing pricing

– The

lease-to-own offerings resulted in fewer instances of tampering, possibly because customers would eventually own the SHS. However, over the course of the grant period, the Haitian gourde devalued by 25 per cent, making RE-VOLT's pricing models unsustainable. In June 2017, RE-VOLT decided to switch to a one-year lease to own, where the customer paid a down payment of HTG 4,000 and could make monthly payments of HTG 500 for 12 months.

However, they found that while the price point in Haiti was 40 per cent lower than a similar PAYG product in Kenya, the product was still perceived to be expensive in Haiti. The upfront cost of the down payment is often prohibitive and it is hard for customers to see the breakdown of cost and potential savings compared to alternative energy sources. This could also be a result of the two earlier pricing iterations where both the down payment and monthly instalments were cheaper than the final price. Nevertheless, after the grant had ended, RE-VOLT decided to switch to a keypad-enabled product instead of a GSM-enabled one and returned to an HTG 1,000 down payment and HTG 500 per month. This price point provided a far superior value proposition for its customers and still allowed RE-VOLT to make attractive margins.

TABLE 1

Pricing changes during the course of grant

	Perpetual lease (January–March 2016)	2-year lease to own (April–June 2017)	1-year lease to own (June–July 2017)	1 year lease to own (August 2017 onwards)
Down payment	1,000 (\$17)	1,500 (\$23)	4,000 (\$60)	1,000 (\$16)
Monthly payment	250 (\$4)	300 (\$5)	500 (\$7)	500 (\$8)

Source: d.light, RE-VOLT Digicel

Note: Currency conversions made at historic exchange rates for respective quarters

Recommendations

FOR MNOS



Customer education - In countries with low mobile money adoption, the customers signing up for PAYG SHS must learn two technologies simultaneously: mobile money and PAYG solar. Mobile money agents can be instrumental in educating customers to trust and use mobile money services independently. Helping customers transact on their own also frees up the mobile money agent's time, which can instead be used for better after-sales services and upselling other products.

"I have to admit that I put a bit of pressure on the client to take a Mon Cash account. I estimate that it is extra work for me to pay for the client because I have to send the Mon Cash on another phone in order to be able to do the transaction for them. When I send the Mon Cash on the other phone, I am not making any benefit. It is true that when I put it on the other phone and from that phone make the transaction then I get a benefit. That is where it is important for me on a business side."

– Wilmino Phinisse, RE-VOLT agent

FOR SERVICE PROVIDERS



Pricing - Pricing the product appropriately is an absolute must. This does not necessarily mean low pricing because, in markets like Haiti, customers are prepared to pay slightly more to get uninterrupted and quality service. However, it is important to gain customer confidence by demonstrating the value of PAYG SHS effectively and providing them with timely and prompt customer service, even after sales.



Bundling services - RE-VOLT customers in Haiti were keen to pay more for larger appliances, such as televisions and refrigerators, bundled with the PAYG SHS. This presents an important opportunity for PAYG providers such as d.light to increase sales and help their customers move up the energy ladder. Some larger appliances like refrigerators can also be put to productive use, opening more business opportunities for customers.

"I have a bunch of materials that I am not using any more like my television or another radio that I have. Maybe the company should think about a system that has more capacity that could work a television and a radio, even it is more expensive; the payments should still be on a monthly basis. I would not mind either if it was for more time."

– Louis Jean Denizard, male customer

"I was looking on the internet and there's a system that they are selling in Delmas for \$500 but they give you a big solar panel, a big battery, a 16" flat screen TV and a fan. If RE-VOLT could come up with a system that's similar to that one, I would not hesitate to get into that one too. I encourage other people to buy this system; I brag a lot about it."

– Carlo Saint-Hillaire, skilled labourer, male customer



After-sales service - Some customers using the d.light/RE-VOLT products experienced battery issues. When they tried to get the battery replaced, they lost their credit and did not get it back, even after making dispute claims. While instances such as these may be rare, in small communities they can make or break the brand reputation of PAYG companies, which is critical when the most important factor affecting customer purchases is trust. It is important for PAYG providers to provide prompt and effective after-sales service to help retain customers and make them feel valued.

FOR SALES AND DISTRIBUTION AGENTS



Training sales, distribution and mobile money agents - Training agents to understand the overall product offering is very important, as the challenge is often building customer trust and assuring them that PAYG services let them control their spending. It is also worth making sure agents are confident in breaking down the costs for customers and perhaps helping them to calculate their current spending on energy and show how this could be diverted to PAYG payments.

"I am satisfied with the money that I pay for it but what I don't quite understand that remains a mystery to me is that they said that after 2 years, if I finish paying the system, it's mine. After those two years, to get energy do I still have to pay a contribution every month?"

- Louis Jean Denizard, male customer



Conclusion

The d.light and RE-VOLT grant has provided important insights into [scaling PAYG models in greenfield markets](#). While we use the term ‘PAYG greenfield market’ to describe all markets outside East Africa, they can in fact be very different. For example, customer behaviours can vary between urban and peri-urban areas in the same country, as was seen in the non-customer surveys from Kenya and Haiti. It is important to tailor the product offering and pricing to customer needs.

It was also clear that mobile money adoption in new markets almost invariably requires simple user interfaces and regular customer training programmes. Merely having a use case such as PAYG solar may not be sufficient to capture the true value of mobile money services, which is to enable customers to use it independently without the need for mobile money agents to pay on their behalf.

Appendix

Non-customer results – Acumen

Acumen conducted a study in January and February 2017 to investigate why people were not signing up to purchase a d.light pay-as-you-go (PAYG) solar home system (SHS) in Kenya and Haiti.

- Survey goals: to gather data to understand customer profile, energy usage and identify the main reservations and reasons for not signing up for a PAYG SHS.
- Survey approach:
 - » Method: phone interviews by one researcher in Haiti and one in Kenya
 - » Sample size: 50 completed interviews in Haiti, 100 in Kenya
 - » Customer selection: in Kenya, interviewees were randomly selected from a list of customers who had responded to an SMS campaign, and in Haiti from a list of customers who were sent an SMS but did not necessarily respond to it.

customers and follow-up (endline) interviews with the same customers three months later.

The customers reached were from d.light's partner, RE-VOLT's, customer list.

Acumen developed the survey tools to collect data on GSMA grant indicators, which were also designed to collect data on the Global Off-Grid Lighting Association (GOGLA) harmonised impact metrics, alongside Acumen's standard impact and customer insight questions.

- Survey goals: To gather baseline data to contrast with follow-up data. We aimed to collect data on d.light's relative performance against the GOGLA harmonised impact metrics, alongside information on customer demographics, behaviour and satisfaction, which delivered data on the GSMA grant indicators.
- Survey approach:
 - » Method: phone interviews by a trained research officer
 - » Sample size: 283 completed interviews
 - » Customer selection: randomly selected from a full list of new PAYG SHS RE-VOLT customers. Interviews were ideally conducted within one week of installation, but within one month if there were connection issues.

Baseline survey – Acumen

Acumen conducted a study to investigate the impact of the d.light PAYG SHS on the lives of customers in Haiti. The study comprised baseline interviews with new

Calculations of GOGLA metrics

Metric 1ai: Improved energy access (people reached) = sales x discount for loss x discount for repeat sales x household size
 $2,850 \times 93\% \times 90\% \times 5 = 12,440$

Metric 5b: Savings on energy-related spending (over lifetime of product) = sales x discount for loss x ((average spending on baseline lighting methods x replacement ratio x solar product lifetime (warranty period x 1.5) – solar product price))
 $2,850 \times 97\% \times (\$79.19 \times 1 \times 3 (2 \times 1.5)) - \$170 = \$656,592$

Additional assumptions and notes:

- Only calculated impact for d.light PAYG SHS in Haiti
- All 2,850 sales were in the last three years (lifetime of the solar product using GOGLA metrics (1.5 x warranty))
- Using high setting rather than average setting to determine Metric 4a and 4b (7 hours and 80 lumens)
- Phase 2 development of the GOGLA metrics will better represent solar kits, SHS and financing mechanisms. Currently they best represent pico-solar light impact.



For more information on the Mobile for Development Utilities programme visit:
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