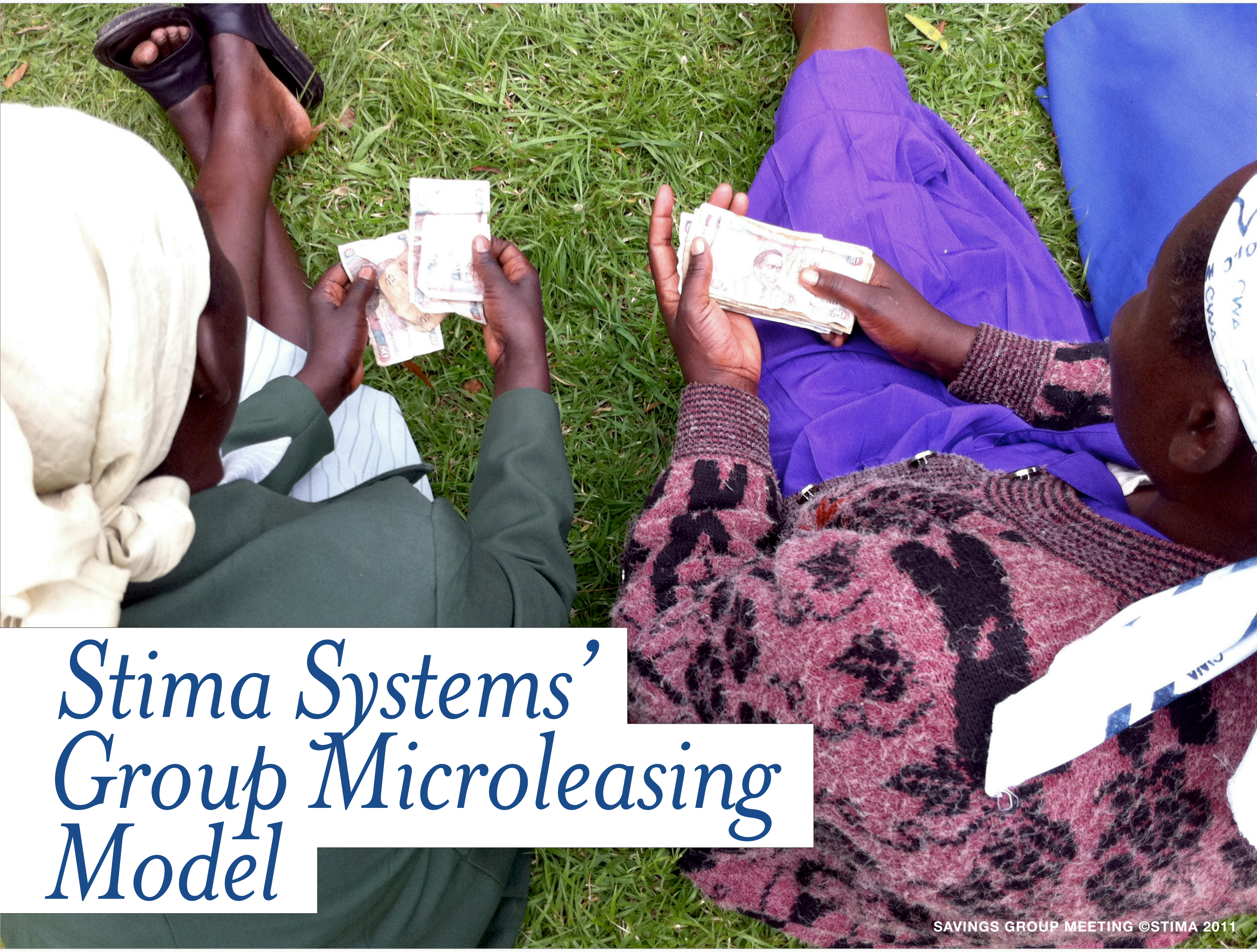


SAVINGS GROUP MEETING ©STIMA 2011

# *Stima Systems' Group Microleasing Model*

AFFORDABILITY MECHANISMS AND ENERGY ACCESS

## Promoting Payment and Reducing Risk at the Group Level

Stima Systems is a Kenya-based energy startup that delivers solar lighting and charging services to off-grid, base of the pyramid (BoP) customers. Stima's founders have drawn from their collective experience in the portable lighting and telecom sectors to develop a distinct approach to service delivery and end-user affordability: the group microlease.

Group microleasing leverages the prevalence, structure and internal dynamics of community-based savings groups to mitigate a number of critical risks and barriers that limit access in the target market. With current operations in Kenya's Great Rift Valley region, Stima aims to expand its business throughout the wider East African market.

**CHANGING LIVES THROUGH ACCESS TO FINANCE FOR CLEAN ENERGY AND WATER**

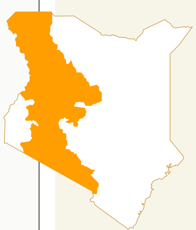
arcfinance

*"In our target group, the family dedicates one daughter to energy collection. The girls are out getting wood, fetching water, and carrying dad's cell phone to market for charging. They are scraping the kerosene can into a plastic vat so that they can save every last drop for the next day."*

—Konrad App, CEO and Co-Founder of Stima Systems

# Stima's Customers

*Context: Kenya, Great Rift Valley Region*



**KENYA POPULATION**
43,013,341

Stima currently operates in rural communities in the Western Great Rift Valley region

64%
**RURAL POPULATION**

23%
**OF HOUSEHOLDS HAVE ACCESS TO ELECTRICITY GRID**

**BOX 1. TECHNOLOGY**

*The Stima Solar Charger*

**SERVICES: BASIC ELECTRICITY**

**ENERGY HARDWARE**

SOLAR PHOTOVOLTAICS (2 WATT)

LITHIUM ION BATTERY STORAGE (2800 mAh)

**UNIT OPERATING LIFE**

18-24 MONTHS

THE HARDWARE ©STIMA 2011

The Stima charger is a lightweight, folding photovoltaic device designed for household use. The charger delivers eight to ten hours of bright light per day, or four to five hours with two LED bulbs. Alternatively, it can fully charge two to three mobile phones or power a USB FM radio for six to eight hours per day. The charger's simple 'plug and play' design requires minimal instruction for installation and operation. Handheld portability means that customers can effortlessly transport devices to meetings for reactivation, thus facilitating the company's savings group-based leasing model.

Stima's target customer base is distributed across the thousands of remote villages in which the majority of Kenya's rural population is settled. Individual communities, numbering 100 to 200 people, are typically separated by several kilometers. Modern transportation infrastructure reaches only limited areas within these regions. As a consequence, local households remain largely dislocated from the formal market economy. Low population density and poverty make the prospect of grid electricity virtually non-existent.

Stima customers earn between USD $1.50 and $4 per day, possess few assets, and have limited access to formal financial services, including microfinance. Subsistence and commercial farming and herding dominate the regional economy, and often multiple household members hold down several jobs throughout the year in order to supplement and smooth their small, seasonal incomes.

For families in this income segment, energy consumption represents a significant expense, amounting to 10 to 30 percent of total expenditures. Outlays for kerosene alone can exceed 30 cents per day. Stima's target customers purchase the fuel in small increments on a daily basis, or when money is available, and as a result pay higher rates per unit than their better-off counterparts who are able to procure greater volumes, less frequently.

Stima markets its services to members of community-based savings groups. As women are more likely to participate in such groups, roughly three quarters of Stima's customers are female.

# Affordability Mechanism: Group Microleasing

As a solar leasing company, Stima markets solar energy services rather than retail products. Its customers pay a fixed, USD $1 per week fee for continuous access to portable solar chargers that deliver household lighting and power for mobile phones and small radios.

Based on Stima's own market analysis, the weekly fee represents a significant reduction in household energy expenditures in the target market. At the same time, superior lighting output and the convenience of at-home mobile charging constitutes a substantial service upgrade for end users. In short, Stima's value proposition to its customers is the promise of more and better energy for less money.

What most distinguishes Stima's approach from other lease models is its reliance on *groups*. Devices are distributed to individuals for personal household use, but leases are formed exclusively with groups of 10 to 20 individuals. The groups are either preexisting or are formed specifically for the purpose of facilitating Stima microleases. Stima has worked closely with savings groups formed by the NGO World Vision and by Catholic Relief Services, whose groups are known as Savings and Internal Loan Communities (SILC groups). Groups are identified and facilitated by a network of Stima agents who are recruited by the company directly from the local area. Once a group is formed, each customer receives a charger, light, and FM radio from the agent.

**FIGURE 1. COST COMPARISON**

**STIMA CHARGER VS. CONVENTIONAL SOURCES**

| SERVICES | SOURCE | TOTAL COST |
|---|---|---|
| LIGHTING<br>8-10 HR X7 DAYS | STIMA CHARGER | $1<br>U.S. DOLLAR |
| MOBILE CHARGING<br>2-3 PHONES PER DAY<br>OR<br>RADIO<br>6-8 HR X7 DAYS | | |
| LIGHTING<br>4 HR/NIGHT X7 DAYS | ¼ LITER KEROSENE<br>($2.10) | $2.70<br>U.S. DOLLAR |
| MOBILE CHARGING<br>EVERY 3.5 DAYS | SERVICE PROVIDER<br>(50¢) | |
| RADIO<br>LAST 8 HOURS | AA BATTERIES<br>(10¢) | |

**BOX 2. CLIENT DEMOGRAPHIC**

### *About Savings Groups*

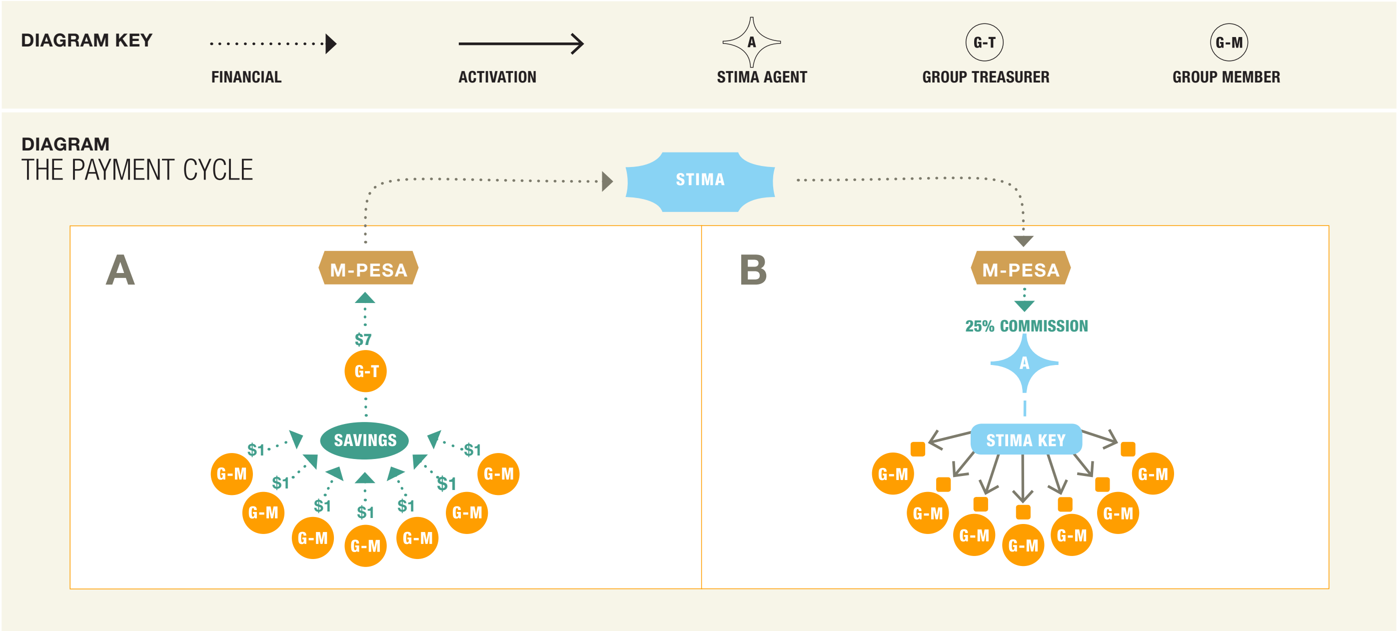
STIMA SYSTEMS' GROUP MICROLEASING ©STIMA 2011

Savings groups are informal, voluntary financial structures that have become increasingly common in remote, low-income areas where institution-based financial services are non-existent. Savings groups evolved from long-established rotating savings and credit associations (ROSCAs) and accumulating savings and credit associations (ASCAs), common throughout sub-Saharan Africa. Savings groups vary by name and, to a degree, methodology across different contexts, but all share a set of common features that aim to enhance the economic security of members.

The savings group's principle function is to enable poor, unbanked individuals to regularly and securely save their money. According to rules established by the group, individual members draw low-interest, flexible-term loans from the pooled fund, thus converting savings into credit. Access to such credit helps members manage cash flows and smooth income inconsistencies, cope with emergencies, and invest in basic assets or income-generating activities. Group sizes vary, ranging between 10 and 30 members.

Increasingly, savings groups are being promoted across East and West Africa by numerous international NGOs and their country affiliates. According to the Consultive Group to Assist the Poor (CGAP), in 2011 approximately four million of the estimated five and a half million savings group members worldwide were located in Africa, with the greatest numbers concentrated in Kenya, Tanzania, Uganda and Mali.

## *Diagram: Stima Systems' Group Microleasing, Payment Cycle*




*Members pay no upfront cost for the Stima charger, but agree to attend weekly meetings where they pay a US $1 fee*

Meetings always convene at the same time and location, and are attended by a Stima agent. All members submit their fee to a designated group treasurer, who then transfers the entire lump amount to Stima via M-Pesa. M-Pesa is Kenya's leading mobile money service, operated by Safaricom, the country's largest telecom. Upon receipt of payment, Stima transfers a 25 percent commission to the agent via the same service, notifying her by text message.

*Customers are compelled to attend meetings to avoid discontinuation of service*

After seven days of continuous use, Stima chargers are automatically deactivated by an internal timer. Service can only be restored, and timers reset, by agents using an activation key [See Box 3. Technology: the Stima Activation Key]. Once reactivated, the charger's built-in timer is reset for another seven days. Either the SMS text sent by Stima to its agent or the treasurer's M-Pesa receipt provides confirmation to the agent that group payment has been made in full, and that reactivation can occur.

*Agents reactivate the members' chargers only when Stima has received the total weekly fee amount for all members in the group*

For example, if nine members have paid the fee, but one member has not, then none of the group members' chargers will be reactivated. The full amount must be paid by the group as a whole. It follows that in the event of non-payment by one or more individuals, the rest of the group members must provide the remaining balance for group reactivation to occur. This joint liability between members is central to the group microleasing model and is the key driver of full payment rates.

*Groups can choose to expel or replace members who regularly do not pay*

Stima has found that, on average, 80 percent of members are able to pay on any given week, covering for the other 20 percent of members who are unable. Generally, the members who are in arrears must pay the group by the next week or they will be expelled by the group. Expulsion or admission to a group, however, is entirely controlled by its members, not Stima. Members can return their charger, discontinue the microlease and exit the group at any point without penalty.

- Groups coordinate fee collection at the same time and place each week
- Even in remote regions of Kenya, Stima can reliably depend on M-Pesa agents being present

20%
AVERAGE % OF SAVINGS GROUP MEMBERS THAT CANNOT PAY EACH WEEK

80%
AVERAGE % OF SAVINGS GROUP MEMBERS THAT CAN PAY EACH WEEK

100%
AVERAGE % OF ON TIME PAYMENT BY THE SAVINGS GROUP EACH WEEK

# Analysis: Key Drivers & Support Factors

## Customer Value

Stima costs less than conventional energy sourceswhile providing higher levels of service. From an end-user perspective, this is the most fundamental driver. Stima customers enjoy brighter and higher quality light at a lower cost than kerosene, and gain both savings and convenience from being able to power their own phones and radios. On a weekly basis, this clear upgrade in service costs the customer less than half of the average combined expenditure for kerosene and charging. Stima believes that the microleasing model structures payment and risk in a way that makes the transition away from kerosene both affordable and highly attractive to target customers.

**BOX 3. TECHNOLOGY**

### *The Stima Activation Key*

THE STIMA KEY ©STIMA 2011

To ensure ongoing payment from customers, the Stima charger is programmed to automatically disable service every seven days. Service is "unlocked" with a simple activation key that is inserted into the charger.

Only one key works with any one charger, preventing reactivation from any other key. The key stores performance and usage data during reactivation, which Stima uses to identify technical problems, optimize product design, and monitor agent and user performance.

The key also expires, preventing agents from running a business without Stima. Keys are programmed to expire in four weeks for new agents and in longer periods of time for more proven agents. Agents report back to master agents to reactivate keys and get additional chargers. This promotes regular contact and communication within Stima's hierarchy of field staff.

The key also serves an additional marketing function. Short product-related queries scroll across the key's mini LCD screen when reactivation occurs. Customers are prompted by the agent to answer yes or no questions by pressing one of two buttons embedded in the key. Master agents retrieve responses during key reactivation. This survey function helps Stima gauge demand and solicit orders for additional services and upgrades.

## The Group is Indispensable

The facilitation of lease payments through groups rather than individuals is the cornerstone of Stima's microleasing model. Initial trials with individual microleasing were "an utter failure," according to the company's founders, resulting in payment rates as low as 5 to 20 percent, with widespread product loss, theft and resale by end users. Groups, by contrast, create conditions that distribute and reduce risks and costs for both Stima and its customers, supporting repayment rates of nearly 100 percent.

One of the most important dynamics at work in the Stima group model is the joint liability between members. Significantly, this core element of the mechanism borrows more from the Grameen microfinance group lending methodology than from any of the standard model characteristics of savings groups. Since chargers are reactivated only when payment of fees for all members is made in full, individuals are strongly compelled to pay through their obligations to one another. They are also incentivized to recruit and form groups with people whom they trust will regularly pay the weekly fee. Because members of small rural communities have a level of mutual familiarity and knowledge of one another that cannot be cost-effectively attained by Stima, groups perform an important screening function when joint liability is introduced. In reducing their own risk by selecting members who are likely to pay, customers also reduce Stima's risk of nonperformance, theft or resale of assets. And once groups are formed, they are motivated to replace frequent non-payers with more reliable members.

While the amount and frequency of payments are fixed under the microleasing model, and joint liability

*"The group methodology is just black and white. When you work with a group, they pay 100%."*

—Homayoon Shahinfa, President and Co-Founder, Stima Systems

imposes clear and rigid obligations on members, the model is not without elements of flexibility, which, for the end user, correspond favorably with household cash flows. For example, there are no financial barriers to entering or exiting the microlease beyond the effort required for group formation. Members are not required to pay any deposit or upfront fees, and if they decide they cannot afford the weekly payment they simply return the device at any time without penalty. Stima can assume this apparent risk because of the effectiveness of joint liability in ensuring payment.

Similarly, within the context of a Stima group, while repeat non-payment will likely lead to ejection, occasional non-payment is to be expected and will be accommodated by members. Each member is prepared to occasionally cover other members, and can reasonably expect the same treatment in return. In this way, joint liability serves as a buffer rather than a constraint, smoothing shortfalls in income that prevent individual payments. And given that the level of savings gained by users from displacement of kerosene and charging costs is comparatively high, groups can absorb multiple non-payers on a given week and still pay less than they would for conventional sources.

Finally, the very fact that savings groups are groups generates additional value for both Stima and its customers. Groups distribute and reduce transaction costs for all parties. For example, by paying in one lump sum, the cost of using M-Pesa is spread out among all members of the group. In an individual payer scenario, this cost would be prohibitively high.

Groups also bring together several individuals in one place at set, predictable times. Rural operating environments are characterized by low population densities and poor infrastructure, making marketing and distribution complicated, risky and expensive for suppliers. The voluntary congregation of groups simplifies logistics and drastically reduces operating costs for Stima and its agents. Groups are also largely self-coordinated, with their own rules and decision-making structures. As a result, additional coordination costs are not borne by Stima.

## Weekly Payments

Weekly payments strike the right balance between the needs of Stima and its customers. Stima's early trials tested daily, bi-weekly and monthly repayment terms, but each proved problematic. Daily payment was most popular with end users because it closely matched their kerosene purchasing habits and involved the smallest payments. However, the cost of paying via M-Pesa each day proved too expensive for the customer, and such a frequent schedule does not lend itself to group formation. Also, the time and resource commitment required to reactivate chargers on a daily basis was impractical and uneconomical for Stima. By contrast, the bi-weekly and monthly increments involved large fee amounts that were beyond the average customer's capacity to pay and ability to save. For Stima and its customers, the weekly payment schedule represents an acceptable balance between fee amount and meeting frequency.

## Service and Customer Contact

Perpetual service and customer contact reduce the risk of energy access disruption. The perceived threat of technical failure represents a major barrier to demand and therefore energy access. The energy poor are understandably reluctant to invest in energy products that are poorly made and likely to fail before full value is realized. Under the microlease, weekly meetings between customers and Stima agents, and monthly or bi-monthly contact between agents and master agents, make the model highly responsive to technical problems on a continual basis. Since revenues and commissions are generated from ongoing service and not from the one-time sale of a product, Stima and its agents have a strong incentive to quickly address any technical issues that arise. A malfunctioning product is replaced within one to three days. If replacement time exceeds this period, customers are not required to pay the weekly fee. This incentive structure has proven difficult to replicate in the context of retail sales.

*"We incorporate the power of groups into every aspect of our service—into the distribution, recruitment, training, collection, re-activation and management of users. This lowers otherwise huge operational costs associated with working in remote villages and allows us to pass on savings to our customers."*

—Konrad App

# Factors Influencing Scale

## The Growth of Savings Groups

Stima aims to have 10,000 of their charger units in the field by March 2013. Given the central importance of the savings group model within Stima's microleasing approach, potential for scale is closely tied to the rate of proliferation of the savings group model in the target market. In this regard, current and projected growth bode well for Stima: the current number of savings group participants could expand several fold in the next decade, amounting to tens of millions of new members, with the strongest growth concentrated in East Africa. Growth is driven by the clear value that groups provide members, and by the fact that formation requires very few resources on the part of either promoting organizations or, more importantly, communities. Once formed, groups become increasingly independent of the facilitating organizations that helped convene them, and do not require external financial or technical support on an ongoing basis.

For Stima, as groups continue to multiply, so does the size of the company's potential customer base. Perhaps even more significant than the growth of actual savings groups is the spread of the idea and knowledge of savings groups, and the localization of expertise on how to implement and maintain them. This has powerful implications for Stima's scalability. When practical experience and familiarity with savings groups already exist in target markets, the potential for Stima-exclusive groups to form organically and spontaneously becomes more possible. In short, customers merely need to understand the savings group model to engage, and increasingly that level of knowledge is deepening in the target market.

Stima is also considering a parallel strategy to expand its marketing capacity and sales. Kenya is among the largest and most mature microfinance markets in sub-Saharan Africa, with 1.1 million active borrowers as of 2011. The company aims to engage with local microfinance institutions (MFIs) in order to further induce group formation and expand their customer base. Through this initiative, MFI loan officers would offer their clients the income-generating opportunity to become Stima agents by loaning them Stima chargers as opposed to money, which they would use to start microlease groups in their communities. Stima's founders tested this approach in pilot programs and found that loan members could easily recruit and manage multiple user groups. But because there are significant costs involved in generating and distributing marketing material to loan officers, Stima will begin engaging with MFIs as their operations scale up and their access to more capital increases. Stima estimates that using MFIs as an additional channel for accessing customers could enable them to reach 102,000 users by September 2014.

## Mobile Money Uptake and Infrastructure

Stima reduces the cost of fee collection at two different points. First, groups – not Stima agents – coordinate collections internally at a single point in time at one meeting location. Second, the widespread penetration and popularity of M-Pesa, even in very remote regions, means that Stima can reliably depend on M-Pesa agents being present in most locations where it intends to operate, enabling groups to conveniently transfer fees directly to the company. M-Pesa is also used to transfer commissions to agents and master agents.

M-Pesa not only greatly reduces the direct and indirect costs of collection and commission allocation, but also secures against the risk of theft or delayed payment. M-Pesa-to-agent density is key to inward and outward cash flows, and therefore the viability of the model as a whole.

While mobile money continues to grow in popularity among BoP households in several East African countries, nowhere has uptake been as widespread as it has in Kenya with M-Pesa. Stima is still early in its deployment, and intends to focus on the Kenyan market for the near future. However, the company does plan to enter other markets in the region where mobile money penetration has not attained the scale that it has in Kenya. Lower access to mobile money services could constitute a constraint for Stima that is not present in Kenya. Less developed mobile money platforms in the region charge significantly higher transaction costs than M-Pesa and require Stima to host its own server infrastructure. However, Stima's founders believe they can begin negotiating lower transaction costs once they scale up to 10,000 users, an attractive potential customer base for a telecom operator.

## *Closing: Lessons Learned*

### *Individual leasing on the micro-scale is incredibly difficult*

Stima's early experiments with individual lending resulted in low rates of payment and customer retention, and high rates of theft and product resale. The group context creates a transparent system of member accountability that incentivizes complete payment, while also creating some flexibility for the occasional missed payment. For the USD $1 to $4 per day market, this dynamic has proven essential to Stima's model.

### *The target BoP segment has highest demand, but is also most likely to participate in groups*

In Stima's experience, individuals earning USD $1 to USD $4 per day are most likely to participate in groups, and therefore succeed with Stima microleasees. Individuals earning less than $1/day are less likely to save or contribute consistently to group payments, while those earning over $4/day are able to reduce energy costs through the purchase of a car battery and are less willing to consistently cover defaulting users or spend time attending meetings. Both income segments are consistently expelled by groups.

*Thank you to the members of the Stima Systems team for their collaboration in writing this case study*

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