



SOLAR SME RESEARCH ANALYSIS

INVESTMENT RECOMMENDATION

February 19, 2016

I. Introduction/Overview

MCE has the unique opportunity to invest in companies providing solar energy to off-grid communities in East Africa. In attempts to solve energy poverty where some 1.3 billion people worldwide lack access to electricity, trailblazing SMEs have introduced products ranging from portable lights to solar home systems. These products offer populations suffering from energy poverty the opportunity to improve access to energy, health, education, economic empowerment, and other areas of impact.

In order to determine the level of interest MCE should have in investing in these companies, the following venture criteria and impact criteria is taken into consideration:

Venture Criteria: Predicted growth (e.g. how many anticipated people reached), number of full-time employees, and if possible, anticipated growth of revenues from expansion into new markets.

Impact Criteria: Amount of activity in the different solar impact areas, level of dedication to employ qualified local technicians, and level of interaction with local markets and entrepreneurs.

II. Company Backgrounds

Overview						
Company Name	Country of Operation	Year Established	# of People Reached	Delivery Model	Payment Model	
M-KOPA	Kenya	2012	300,000+	Self-Installation ¹	Pay-as-you-go ²	
Mobisol	Tanzania, Rwanda	2010	150,750	Self-Installation	Pay-as-you-go	
Off-Grid Electric	Tanzania, Kenya	2011	250,000	Self-Installation	Pay-as-you-go	
PEG	Ghana	2013	132,000	Local partners ³	Pay-as-you-go	

M-KOPA- Kenyan solar provider leading the way in “pay-as-you-go” energy for off-grid customers, featuring an innovative business model that stems from making solar products affordable to low-income households on a pay-per-use installment plan where customers acquire solar systems for a small deposit and then purchase daily usage using their mobile phones.

- **Product:** M-KOPA IV Solar Home System. Solar home system featuring solar panel, LED light bulbs, rechargeable torch, phone charging USB, and rechargeable radio. Paid through an affordable M-KOPA payment plan, designed to scale across multiple markets.

¹ Self-Installation indicates that the SME does the vast majority of product delivery, installation, and distribution itself

² Pay-as-you-go refers to a payment model where customers pay for the product with an initial deposit followed by an installment plan, which can be paid off at the customer’s convenience using mobile services like M-PESA. When the installment plan is paid in full, customers own their solar systems outright

³ Local partners refers to the SME cooperating with local institutions to assist in the delivery, installation, and distribution of their solar products

Mobisol- East African SME focusing on socioeconomic empowerment for off-grid populations through providing safe, clean, and sustainable solar energy. Clients pay monthly installments using their mobile phones. After a three year period, they fully own their personal electricity source.

- Product: Solar home systems featuring a panel ranging in size, LED light bulbs, a portable lantern, and mobile phone charger.

Off-Grid Electric- SME that designs, manufactures, installs and maintains solar home systems in Tanzania and Rwanda. Company enables customers to pay with mobile money services like M-Pesa.

- Product: Solar home systems providing solar panels, LED lights, and appliances to optimize energy output from panels.

PEG- One of the largest off-grid solar companies in Ghana, providing solar home systems on credit to households in West Africa.

- Product: Solar home systems featuring solar panels to power appliances such as lights, phone chargers, and radios.

Products			
Company Name	Portable Lighting	Portable Chargers	Solar Home Systems
M-KOPA	✓	✓	✓
Mobisol	✓	✓	✓
Off-Grid Electric			✓
PEG			✓

III. Investment Recommendations

In this section the companies are rated on a 1-3 scale in terms of investment interest (with 1 being greatest interest to MCE).

A rating of 1 indicates that the company is a good match towards both the venture criteria and impact criteria that MCE looks for in a potential investment. The company has a proven record of growth and is projected to increase number of customers and employees, as well as sales and revenues in the next few years. Additionally, the company shows superior dedication to impact a variety of areas with their products, demonstrates dedication to employ qualified technicians, and is committed to interacting with and fostering an ecosystem of prosperity and growth within the communities they serve.

A rating of 2 indicates that the company is a good match towards the impact criteria that MCE looks for in a potential investment, but not so much the venture criteria. In many cases, these companies exhibit the same level of dedication for a company rated 1, but are either too large or too underdeveloped for an MCE investment to have catalytic impact.

A rating of 3 indicates that the company neither quite fits the venture or impact criteria of an MCE investment.

Companies:

Mobisol

Investment Interest: 1

Venture Criteria: Mobisol launched Q2 2013 with 1,800 solar systems. By October 2014, the number of systems sold grew to 9,000. As of October 2015, over 30,000 sales were attained. For 2016, the company plans to scale-up operations and reach 100,000 sales by Q3 2016. Mobisol's steady growth in sales and revenue along with its willingness to venture into African and Asian markets indicates the need for external investment to finance their mission of providing lasting local impact for economic empowerment and environmental protection. Furthermore, with 350 employees as of December 2015, an MCE investment could catalyze the employment of more qualified local technicians as Mobisol continues to expand into new markets.

Impact Criteria: Mobisol is quickly becoming a leader in improving access to energy for off-grid populations, with 150,750 people reached, 90,000 children with the ability to study at night, and ambitions to nearly triple this total;

an investment from MCE could be catalytic in increasing energy access and health impact areas. Additionally, Mobisol directly created over 500 jobs in East Africa and over 10,000 entrepreneurs have created incremental income using their solar system, meaning an investment from MCE could equal additional impact in the form of economic empowerment and local employment.

PEG

Investment Interest: 1

Venture Criteria: Since its inception in 2013, PEG has experienced expansion in the form of 5,000 households to 30,000 households by the end of 2015. This proven growth coupled with the ambitions of the company to expand into some of Ghana's more remote regions as well as neighboring countries in West Africa (already raised \$3.2 million to support these efforts) makes PEG an attractive option for an MCE investment. Furthermore, PEG's desire to quadruple its local employment force from 250 staff to 1,000 also presents an opportunity for MCE to provide catalytic growth.

Impact Criteria: PEG aligns with many of the impact areas MCE supports. They demonstrate special dedication to using solar power to alleviate women and children from being disproportionately affected health and education-wise (as they typically spend more time in the home, creating more exposure to kerosene). PEG has also shown dedication towards creating impact in the form of economic empowerment, (namely financial inclusion and asset ownership and savings) but currently only have projections for the amounts of money their customers are expected to save and the benefits of introducing them to the banking sector. With MCE support, PEG could have a greater effect in their impact areas.

Off-Grid Electric

Investment Interest: 1

Venture Criteria: Recently, Off-Grid Electric raised \$70 million in equity and debt financing in 2015, including \$45 million investment vehicle for distributed solar and battery storage for customers. This investment vehicle would be the first of its kind and presents a unique opportunity for MCE to contribute to 1) a new asset class of institutional and impact investment, which would catalyze the expansion of Off-Grid Electric into a frontier space, and 2) the growth of the company and its impact holistically. Off-Grid Electric also aspires to be one of the largest employers in the renewable energy sector in Africa and is already creating 40 jobs per month, meaning that support from MCE could increase this already steady job creation rate.

Impact Criteria: Off-Grid Electric has exhibited substantial impact in several of MCE's target areas, including health and education as well as showing interest in creating economic empowerment, and employment. The company keeps track of customer feedback detailing a 149% increase in study time and a reduction of 140kg of Carbon Dioxide in households per year. An investment from MCE could improve the impact areas the company is passionate about, but still remain problematic (namely financial inclusion, savings, and employment). Only 34% of people in the countries the company operates in have access to formal financial services, and support from MCE would provide Off-Grid Electric with the resources to reach more customers and provide them a use for mobile payment services and savings accounts.

M-KOPA

Investment Interest: 2

Venture Criteria: M-KOPA is the most developed company in this memorandum. In three years of operation, they have experienced unprecedented growth (250,000 homes in Q3 2015 to 300,000 by Q1 of 2016, at an estimated rate of 500 homes per day) that they can attribute to their scalable technology featuring intuitive interfaces for customers and a service-oriented sales approach and affordable payment plans. Additionally, the company has cited between 250-650 full time employees operating in East Africa and demonstrates superior commitment to hire local technicians and sales professions, as indicated by the 1,000 commission-based employees across their three countries of operation. Due to M-KOPA's rapid market expansion and the number of employees already staffed by the company, it is uncertain whether an investment from MCE will create additional catalytic growth in a company that continues to scale-up at a fast pace.

Impact Criteria: Despite the arguably larger scale of M-KOPA in comparison to the other companies in this memorandum, the impact of the company is arguably superior. It has reached more vastly more homes than competitors, providing access to over 300,000 households. Additionally, the level of impact the company has had in the realm of economic empowerment stands out, with an average of US\$750 being saved per customer household over a 4-year period using M-KOPA services; equaling more money in the hands of customers.

Summary of Impact					
Company Name	Energy Access ⁴	Health ⁵	Education ⁶	Economic Empowerment ⁷	Local Employment ⁸
M-KOPA	✓	✓		✓	✓
Mobisol	✓		✓	✓	✓
Off-Grid Electric	✓	✓	✓	✓	✓
PEG	✓	✓	✓	✓	✓

IV. Conclusion

In summary, the purpose of this memorandum is to indicate which companies providing solar energy products to off-grid populations deserve the attention of MCE. To briefly recap, Mobisol, Off-Grid Electric, and PEG all scored an investment interest rating of '1' due to their proven records of growth, records as established companies, and expectations of future growth or expansions into new markets or ventures—which can be accelerated with an investment from MCE. While M-KOPA's dedication to impact areas mirrors those of MCE, the growth of the company has developed to a point in which it is questionable if an investment from MCE could catalyze the growth of the company further than its current forecasts. Additionally, other companies that were considered for this memorandum but were considered to be already too big for a catalytic investment were Barefoot Power and d.light—which have been in operation for over ten years and have already reached a benchmark of 10 million customers.

⁴ *Energy Access*- The organization is dedicated to bringing light and energy to the 1.3 billion people that do not have access to electricity. Impact is typically measured in the amount of people and households that have received a product or service by the organization.

⁵ *Health*- The organization wants to reduce the amount of kerosene used to light homes. Kerosene is a dirty fuel that causes suffocation, respiratory infections, and headaches. Impact is usually measured by the amount of CO2 reduced from converting kerosene-burning households into solar using ones and the reduced number of deaths from health conditions brought on by kerosene fumes and kerosene fires.

⁶ *Education*- The organization is looking to empower people and children who are restricted from doing work/studying after dark. Impact is usually measured in hours of productive work added to a person's day and children's improved grades at school.

⁷ *Economic Empowerment*- The organization has a focus on empowering its customers through financial inclusion, asset ownership, savings, and fosters an environment that enables business creation. Impact is measured in the amount of money saved per household after switching from kerosene to solar, number of savings accounts added, number of businesses created, etc.

⁸ *Local Employment*- The organization has a desire to employ local professionals. Impact is measured in the number of locally trained technicians that are employed by the organization.