

## Trust, Demand and Last Mile Distribution: The Role of Headteachers in Building Africa's Market for Portable Solar Lights

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### Introduction: The Potential of Portable Solar Lights in Africa

A new generation of cheap, high-performing solar lights presents us with an unprecedented opportunity to deliver clean, safe lighting and phone charging to millions of people in remote parts of the developing world. These lights can cost as little as €6, last over five years and require no specialist installation or maintenance. By replacing kerosene lamps they have a dramatic socio-economic impact, saving households 10 to 25% of household income, whilst enabling children to study for longer, under better conditions at night (Energy for Life, 2012). Whereas government grid expansion predominantly benefits a wealthier, urban population, the microsolar market benefits poorer people in rural areas – those for whom grid access remains a pipedream, even with major investment in grid expansion.

In Africa solar light penetration has increased from 1% in 2010 to around 3% today, but there are still over half a billion people reliant on kerosene, batteries or candles for lighting. In stark contrast with multi-million dollar, grid-centric government energy programmes which struggle to keep pace with population growth, the microsolar market is projected to grow by at least 70% year on year between 2012 and 2015 (Dalberg Associates, World Bank Lighting Africa Programme, forthcoming). This growth rate would get solar into around 15-20% of homes by the end of 2015. SolarAid believes that the



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market could grow much more quickly if companies, governments and NGOs work together to overcome some of the key constraints on market growth – namely, trust in solar technology, availability and affordability.

This paper examines some of the key challenges facing any last mile distribution system that aims at reach those at the bottom of the pyramid, in remote areas characterised by poor transport and communications infrastructure. Its purpose is to present SolarAid’s community distribution model and explore the reasons for its success. The paper hypothesises that the crucial innovation has been to work with headteachers - trusted community leaders - to promote lights to the parents of students. Bringing headteachers together, training them and incentivising them with free lights, SolarAid has been able to reach huge numbers of people without visiting every village. This hypothesis is tested by exploring the ways in which the model overcomes some of the challenges encountered by other approaches.

The paper is based on a review of key literature as well as a series of interviews with staff working for SolarAid’s subsidiary distribution business, SunnyMoney, and other leading portable solar light distributors. It explores the way in which this unique community distribution model can overcome two of the three main barriers to market growth – namely trust in solar technology and availability. It argues that this distribution model is most appropriate at an early stage, when trust, demand and market penetration are low, and it is vital to reach out to early adopters. Once SolarAid’s model has catalysed the market, other distributors are more likely to be able to profitably enter the market using other distribution models, creating the ecosystem to service the early majority and late majority who will be more willing to invest after witnessing early adopter success. Once trust in solar is established through widespread ownership of the cheapest study lights, there is increased interest in larger solar systems and other off-grid renewable technologies.

It is the sequencing of routes to market at different stages of market growth – starting with selling the smallest study lights through schools, and ending with selling larger products through sales agents or dealer networks - that offers a unique chance to eradicate the kerosene lamp from Africa by the end of the decade. Policymakers, NGOs, businesses and investors must come together to address barriers and provide adequate financing, recognising the opportunity to achieve both social impact and financial returns. Crucially, these stakeholders must fully comprehend the way in which dangerous, expensive kerosene traps people in poverty, and the transformative impact portable solar lights have through delivering affordable clean light. They must see the exciting potential of solar to bring millions into the knowledge economy through powering mobile phones, radio and energy-efficient televisions.



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## The Big Challenge: Building a Last Mile Distribution System for a Virgin Market

One of the biggest constraints holding back the growth of markets at the bottom of the pyramid has been the absence of proven last mile distribution strategies which simultaneously generate and meet demand (Monitor, 2012). Demand must be built because customers are often unaware of the benefits of quality solar light use, and have not had the opportunity to experience these benefits for themselves. They may have had a bad experience with a fake or low-quality solar product in the past, for example. Consequently, retail prices are driven up not only by high distribution costs but by high marketing costs. There are less 'eager early adopters' in bottom of pyramid settings compared to other markets (ibid). Last mile distribution requires peer-to-peer social marketing on a shoestring. Distributors must cover vast, sparsely populated areas with weak transport and communication infrastructure, and reach customers who tend to be suspicious of 'outsiders' and new technologies.

SolarAid has overcome these challenges so successfully that its social business, SunnyMoney, has sold over 338,000 lights in the last 12 months, growing over 550% year on year to become the largest seller of solar lights in Africa. Like many other inclusive business start-ups it has had to *"innovate on multiple dimensions simultaneously... pioneering new business models that are tailored to the particular needs and constraints of the Bottom-of-Pyramid marketplace"* (Monitor, 2012). In these high risk environments, enterprise philanthropy *"can play an important role in closing the pioneer gap between Blueprint and Scale"*, effectively acting as a form of subsidy to *"catalyze the development of firms pioneering inclusive business models that are intended to be commercially viable and to grow to scale"* (ibid). Enterprise philanthropy - raised by SolarAid from a range of aid agencies and companies - enabled SunnyMoney to take its model from blueprint to scale.

## The Role of Headteachers in the SunnyMoney Community Distribution Model

The high cost of kerosene means naked flame lighting is used sparingly. For example, children are often unable to study or read for as long as they need to because their parents cannot afford it. A core insight has been that the desire to invest in education is a key driver of the first solar light sale. As trusted community leaders headteachers are exceptionally well-placed to promote lights to the parents of students. Once headteachers and happy customers



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endorse lights and once people experience the benefits of microsolar lights for themselves, demand takes off. The SunnyMoney community distribution model builds trust and demand through a sequencing of routes to market, appropriate for different stages of market growth:

1. **Schools Promotions:** In virgin markets, where demand is low to non-existent, we work with local education authorities to bring groups of headteachers together and train them to promote solar lights to the parents of students. Once headteachers have secured orders, we deliver lights for them to take back to their communities. SolarAid research has shown that it is only once trust has been built through this approach that local vendors and distributors are willing to stock and promote products (Howe et al, 2012).
2. **Follow-Up Sales:** As demand begins to build and people see lights working in their communities, we sell lights directly to headteachers, delivering them on public transport for them to sell on in their communities.
3. **Dealer / Sales Agent Networks:** Once enough demand and momentum has been created by sales through schools to early adopters, we plan to develop an ecosystem of dealers or sales agents to sell lights to the broader community. This is the next step in the development of the model.

The model facilitates the creation of massive demand with a small team, at low cost, in a difficult environment. This enables us to catalyze the market, generating sufficient demand and momentum for market growth to become self-sustaining. Research in risk perception and communication has shown that people tend to perceive an inverse relationship between an acceptable level of risk and the perceived benefit of a product or activity – it is either ‘unacceptably risky and without any benefits’ or ‘risk-free and beneficial’, but hardly ever in-between (Starr, 1969; Fischhoff et al, 1978). The SunnyMoney community distribution model shifts consumer risk perception from ‘unacceptably risky’ due to lack of familiarity and trust in the product to ‘risk-free and only beneficial’, thus bringing the market to a tipping point. In this context, enterprise philanthropy constitutes a crucial form of subsidy for building markets, enabling the market to grow much more quickly. All subsidies can be withdrawn once the market has reached commercial maturity (Monitor, 2012).



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The next section examines this model alongside a number of other 'best practice' models, to explore the advantages of the SunnyMoney community distribution model over other models at an early stage in market development.

### How does the SunnyMoney Community Distribution Model differ from Standard Last Mile Distribution Models?

In 2010, the World Bank's Lighting Africa programme identified the following 'best practice' distribution models, each with its own unique benefits and risks. This section briefly outlines these models and compares them with SolarAid's community distribution model in an attempt to explain the latter's success.

1. The **Distribution-Dealer model** sells products through existing networks of generalist or specialist distributors. Shop owners tend to be based in urban and peri-urban areas, and wait for customers to come to them – they rarely do outreach to rural areas. They do not actively seek to give customers the opportunity to see, touch and experience products. In contrast, SunnyMoney demonstrates products to headteachers, who return to their villages and organise opportunities for people to experience the lights for themselves. Headteachers have a unique relationship of trust with community members, which shopkeepers do not have, making them much more effective at promoting solar lighting during the early stage of market growth.
2. **Proprietary Distribution Channels** are when products move from manufacturer to in-house storage facilities to a salaried sales force, which exclusively delivers products to customers. Only one brand of lights is shipped through this model. In the absence of impartial advice, customers find it harder to be sure they are getting the best light for their money. In contrast, SunnyMoney's product neutrality means it is able to offer impartial advice to customers. Its independence from manufacturers, coupled with the fact that it is owned by the charity SolarAid, makes the partnership with headteachers possible.
3. The **Institutional Partnership** model involves the distribution of lights by government or aid agency entities, usually at a subsidised price. Whilst this model is effective for solar light distribution it risks distorting the market, making it harder for private sector players to profitably enter the market



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when it matures. The SunnyMoney community distribution model mitigates this risk through enabling the sale of solar lanterns at full price. It creates the trust and demand needed to make solar light distribution more profitable and persuade other distributors and investors to enter the market, enabling it to grow.

4. The **Franchise Model** involves offering franchising packages to micro-entrepreneurs. In rural areas, such micro-entrepreneurs must travel around a large, sparsely populated area in order to generate adequate sales. Demand for lights and trust in the seller are critical factors which determine whether micro-entrepreneurs are able to generate sufficient income. In contrast, headteachers are incentivised with free lights for their schools and homes, but are not reliant on solar light sales for their income. Headteachers offer a more appropriate route to market in the early stages of market growth, helping to generate the demand needed for franchise models to become viable in rural areas once demand has been built.
5. Finally, **Rental / Leasing Systems** involve contracting or franchising micro-entrepreneurs to set up solar kiosks. The micro-entrepreneurs either (1) rents products out to consumers on a hourly/daily basis or (2) sells lanterns without a power source and offers a fixed fee for charging. This model overcomes the barrier of high initial cost for the customer, but requires a high initial capital investment from the local entrepreneur. As solar charging kiosks are fixed-location, the level of demand required to make them profitable in sparsely populated areas is high. As with franchise models, this route to market is most likely to be effective at a later stage, once demand has been built through SunnyMoney's community distribution model.

### **Conclusion: Towards a Microsolar Alliance**

SolarAid's model has the potential to be effective across Africa and elsewhere, catalyzing the portable solar light market and enabling rapid progress towards the eradication of the kerosene lamp. The model has had unprecedented success in creating markets in rural areas where others will not or cannot trade. It has done so by establishing a new distribution channel that leverages the relationships of trust headteachers enjoy within their communities. The model is making it possible to sell higher value products at margins which deliver sufficient commercial returns to attract other distributors and investors to the sector. New pay-as-you-go products and schemes are emerging which will further contribute to rapid market growth through overcoming the high



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initial cost barrier. Manufacturers are already benefiting from sales by SunnyMoney, and seeking to develop the products that SunnyMoney's rural customer base wants. In future, other companies will be able to profitably serve rural areas where the community distribution model has operated, to help meet the demand generated.

SolarAid encourages governments to provide an enabling environment for the growth of the portable solar light market through for example, VAT and tariff exemptions for portable solar imports, and supporting longer term initiatives to manufacture lights in-country. Local education authorities, headteachers and schools have a role to play in promoting new technologies, such as solar lights, that improve educational outcomes. Aid agencies should consider scaling up 'enterprise philanthropy' subsidies, for the development of innovative distribution models that catalyze the growth of socially beneficial markets. Under these conditions, a broad coalition of policymakers, businesses, investors and non-government organisations could indeed eradicate the kerosene lamp from Africa by the end of the decade.



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## References

- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy sciences*, 9(2), 127-152.
- Howe, C., Lawrence, J., & Patel, H. (2012). *SolarAid: Revolutionizing the way to make energy affordable for everyone*.
- *Lighting Africa 2010: Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market*. IFC & World Bank, 2010.
- *Monitor 2012: From Blueprint to Scale. The Case for Philanthropy in Impact Investing*. Harvey Koh, Ashish Karamchandani and Robert Katz. Creative Commons Copyright 2012.
- Starr, C. (1969). Social benefit versus technological risk. What is our society willing to pay for safety? *Science*.



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