

## Case study summary

# SolarAid, Africa

2013 Ashden Award winner

“One of the biggest challenges in getting sustainable energy to the poor is reaching the ‘last mile’ – those remote rural areas where commercial distribution and retail networks simply don’t exist. SolarAid’s ingenious distribution methods are getting power to the people who need it the most.”

Ashden judging panel.

Small solar-powered lights can have huge impact in off-grid homes, replacing costly, kerosene lamps and candles with brighter, cleaner light and often now providing phone-charging too. But it is still an enormous challenge to get lights and backup services to remote areas.

UK-based charity SolarAid took on this distribution challenge. It set up a trading subsidiary, SunnyMoney, to catalyse the rural market by starting with sales campaigns through headteachers.

- SunnyMoney holds local meetings with headteachers to promote the benefits of solar lights, and headteachers collect orders from pupils. Subsequent orders can be made through direct sales.
- Lights are sourced from global suppliers, and are sold with warranties for between US\$7 and US\$40, depending on size and features.
- By end March 2013, 408,000 lights had been sold, with 57% in Tanzania (where the campaign started first in late 2010), 27% in Kenya, and 16% in Malawi and Zambia.
- With around 390,000 lights in use, 2 million household members benefit from better quality light without kerosene fumes.
- Replacement of kerosene lamps is saving about 15 million litres/year of kerosene, and cutting greenhouse gas emissions by 36,000 tonnes/year CO<sub>2</sub>e.
- SolarAid research showed the main use was for study, also cooking and general household lighting.
- Kerosene saving of about US\$1 per week means that cost is recovered quickly.
- Competitive procurement process is under way, using field experience to specify requirements for the next generation of SunnyMoney lights.
- SunnyMoney is launching operations in two new countries in 2013, and aims to be active in 24 countries by 2020, with schools campaigns followed by direct sales and then local distributors.
- SolarAid was founded in 2006 to bring clean solar energy to the poorest people in the world. It had 62 employees and an income of £3.58 million in FY 2012-13, with 68% from sales and 32% from grants and donations. SunnyMoney is wholly owned by SolarAid.

### Key facts

408,000 solar lights sold

2 million people benefit

36,000 tonnes/year CO<sub>2</sub>e savings

### Location



“The kerosene lamp that I use is affecting me because there is a lot of soot - that’s why I decided to buy this solar light. The money I used in buying kerosene daily, I can now use for other activities.”

Timothy, solar customer



Timothy takes delivery of his new solar lamp.

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# Case study

## SolarAid, Africa

### Background

Small solar-powered lights can have huge impact in off-grid homes, replacing costly, kerosene lamps and candles with brighter, cleaner light. The technology surrounding solar lights has greatly improved over the past ten years, and many now also charge mobile phones. Prices have come down with the falling cost of PV modules and LED lights, and international standards have helped to improve quality.

But it is still an enormous challenge to get lights and backup services to the people in remote areas who would benefit most from them. SolarAid took on this distribution challenge by seed-funding a trading subsidiary, SunnyMoney, in order to catalyse a viable market for quality solar lights in remote rural areas, encourage other solar providers to enter the market, and displace kerosene.

### The organisation

The UK charity SolarAid was founded in 2006, with the aim of bringing clean solar energy to the poorest people in the world. SolarAid started selling solar lights in 2007, and set up SunnyMoney in 2010 as an independently registered entity to drive forward these sales. SolarAid had 62 employees and an income of £3.58 million in FY 2012-13, with 68% from sales and 32% from grants and donations. SunnyMoney is wholly owned by SolarAid and future profits will be reinvested into ventures in keeping with the charity's aims.

### The business model

SunnyMoney has developed a generic sales and distribution approach over several years, which overcomes the key barriers of reaching remote areas, building consumer trust, and affordability. The programme can be adapted to work in different countries and currently runs in Tanzania, Kenya, Zambia and Malawi: it has gone furthest in Tanzania where the schools campaign started in late 2010.

### Schools campaign

The schools campaign aims to promote the benefits of solar-powered study lights to the headteacher of every school in the country of operation, by working through the country region by region. Visiting each school would take years (for example, Tanzania has over 16,000 schools), so instead groups of between 20 and 80 headteachers in a local area are invited to a meeting with a SunnyMoney field team at a convenient central venue (often a school). At the headteacher meeting the team members demonstrate and explain the benefits of solar study lights, answer questions, then invite headteachers to collect orders in their school, with the incentive of a free study light for every 40 orders, or a larger light for 80 orders.

About two weeks later, the team returns with stocks of lights, for a sales meeting. During this time, the SunnyMoney call centre at the country headquarters will have made contact with each headteacher to confirm the meeting date, answer questions and find out approximate numbers of lights required. Headteachers come with orders and payment, collect their lights and take them to their school to distribute. A second sales meeting is held a few weeks later to supply additional orders, giving more people a chance to save up for a light.

SunnyMoney must have permission from the education authorities to carry out this

**“I think teachers also need this solar. because you know, they need to do preparation in the night, they have to read and write.”**

Patrice Tabanya, headteacher, Geita, Tanzania



Headteachers at Buhungukila primary school listen to SunnyMoney field staff explaining the benefits of solar lights.

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SunnyMoney must have permission from the education authorities to carry out this campaign, but this has not been a problem: authorities in all countries have been strongly supportive. The initial approach to the regional education authority is followed by liaison with district education officers to find out details of all schools in their district, divide them into groups, and set up the headteacher meetings.

### Direct sales

Currently the schools campaign is the main work of SunnyMoney in all four countries. Direct sales have also started in Tanzania and Kenya, and will become the main focus when all schools in the country have been serviced.

The direct sales programme allows headteachers (and other teachers) to order further lights, with the same incentives, after the campaign team has left their region. The minimum order is 20 lights: payment must be received in the SunnyMoney bank account before the order is dispatched by local bus. The SunnyMoney call-centre team follows up headteachers to remind them about direct sales, but many orders come independently – even from regions that have not yet been targeted. The sales come from general marketing through radio and magazines, and also from word-of-mouth recommendation. Direct sales give people the chance to save up, to buy an additional light, or replace a light which reaches the end of its battery life. They are particularly useful if the schools campaign runs at a time when money is very tight – for instance, just after school fees have been paid, or just before harvest. In Tanzania, where direct sales started in November 2012, they already account for 14% of total sales.

### The technology

Modern solar lights use LEDs as their light source, run from a rechargeable battery that is charged by a solar photovoltaic (PV) module. No specialist technical knowledge is needed to operate them.

SolarAid initially experimented with local assembly of such lights, but found this could not match the quality and price offered by the growing number of global suppliers. The decision was therefore made to source lights from whichever supplier gives the best value. Currently SolarAid's main lights are the S2 model (from DLight) which SunnyMoney promote as the lowest-cost study light for students, and the larger SunKing Pro (Greenlight Planet) which also charges phones (see photos). Small solar-home systems from Barefoot Power are also promoted.

In 2012, SunnyMoney ran its first competitive procurement process, to seek what it wanted in the next generation of study lights, based on in-field experience and customer feedback. Products submitted were ranked on 20 criteria (including technical, cost, ease of packing and shipping, lifetime and warranty) and, after successful field trials, a pilot batch of the top-ranked light will be ordered. SunnyMoney see competitive procurement as a way to improve the solar lighting sector as a whole, as well as to source the best products for customers.

### How much does it cost and how do users pay?

At present, prices during the campaign range from about US\$7.50 for the DLight S2, and up to US\$40 for the larger lights. Prices vary somewhat from country to country, and there is sometimes a subsidy during a campaign. Prices are 15-20% higher for direct sales, since these are not subsidised, and must cover the cost of transport. A key pricing strategy is not to skew the market prior to it maturing, since it would be difficult for a developing country to recover from this.

Currently all sales are cash in advance, but SunnyMoney is looking at a number of options for making staged payments.

### Data

Behind the face-to-face meetings is a thorough system of collecting data. Each headteacher fills in a question form with details about their school (including contact information, number of pupils and teachers, average grades in national examinations). The order sheet that the head teacher brings to the sales meeting gives the name, school year and contact information (usually the mobile phone number of a parent or guardian) for each purchaser. This database of schools and light owners is a huge resource, both for sales (eg: to send all local owners an SMS when a sales outlet opens) and for research.

The data available opens up the possibility of looking at the impact of solar light on school grades, and learning more about users experience and lifetime of products, on a scale that has not been possible before. This learning will help not just SolarAid but the whole sector



SunKing Pro (Greenlight Planet) with 2.5 Wp plug-in PV module (so that light does not have to be left out in the sun to charge up), variable brightness settings and an integrated phone charger.



Trying out a S2 study light (DLight) with integrated 0.3Wp PV module and LFP battery at a headteacher meeting.



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### Quality control and maintenance

All products must meet Lighting Africa minimum quality standards and recommended performance targets, and also go through a SolarAid internal approval process. SunnyMoney purchases full containers of lights, and checks a batch from each container before distribution.

Customers get a warranty that ranges from six months to two years depending on the product. The expected product lifetime used to be around two years when NiCd batteries were used, but current models have LiFePO<sub>4</sub> (LFP) batteries with an anticipated life expectancy of five years or more. A SunnyMoney sticker on light has the local phone number to contact to fulfil the warranty, or with other questions. Currently only about 1% of lights are returned, and SunnyMoney estimates that possibly 1% more may develop faults but not be returned.

### Achievements

Progress has been rapid. By the end of March 2013, SunnyMoney had sold 408,101 solar lights. 57% of sales are in Tanzania (where the school campaign started first, in late 2010), 27% in Kenya (started in 2012), and the remaining 16% in Malawi and Zambia where campaigns are at an earlier stage. With just a few early lights reaching the end of their useful battery life, over 95% of lights sold (or about 390,000 lights) are thought to be in use.

Although the primary motivation for purchase is to provide light for children to study, SolarAid research (see below) suggests that lights are used for other purposes, and that the whole household benefits. With around five people per household, this gives about 2 million beneficiaries.

Results from 38 days of headteacher meetings in two regions of Tanzania in late 2012 show the significant reach that the campaign achieves. 93% of headteachers in the regions (whose schools account for 96% of pupils) attended a meeting, and over 5% of pupils purchased a light. Direct sales are already increasing this percentage.

### Social and economic benefits

In 2012, SolarAid conducted an interview-based survey of 85 randomly-selected Tanzanian households who had been using their solar lights for between four and six months. The survey found that most people were happy with their purchase, with 74% 'very satisfied' and a further 19% 'satisfied'. This high level of satisfaction is confirmed by the numbers of direct sales that result from the initial schools campaign: families see that their neighbours are pleased with their purchase, and therefore follow suit.

Interviewees reported that studying was the most important use for solar lights (75%), and that study time increased for an average of one hour per night. This finding is supported by anecdotal reports on improved school grades. The other important uses were in the kitchen, and for general household lighting.

Two thirds of the households surveyed had no access to electricity, and previously spent an average of US\$1.60 (2,900 TSh) per week on kerosene for lighting. This reduced by 71% to US\$0.50 (850 TSh) per week when they had a solar light. With this level of saving, the cost of a small study lamp is recovered in less than two months. It is not surprising, therefore, that saving money was the highest perceived benefit of solar lights, reported by 76% of survey households. Other benefits reported were the ability to study, the quality of light, and avoiding the smoke and fire-risk of kerosene lamps.

**"I tried out the light first with my own children – I've got six of them – and it was really useful to study, but everywhere else too like in the kitchen."**

Beatrice Lushinda, headteacher, Kapapani Primary School, Tanzania



Beatrice Lushinda, head of Lushinda Kapapani Primary School, leaving a sales meeting with 40 lights ordered by her pupils and teachers.

### Campaign reach - Iringa and Morogdro region

2,154 headteachers attended (93% of total)  
745,374 pupils represented (96% of total)  
42,417 lights sold (5.4% of total pupils)



SunnyMoney call centre in dar es Salaam which provides customer support and direct sales for Tanzania.

### Environmental benefits

Cutting the use of kerosene reduces greenhouse gas emissions. The CDM default value for this reduction is 0.092 tonnes/year CO<sub>2</sub>e saved per solar light point (equivalent to about 38 litres of kerosene per year). On this basis, the SunnyMoney lights in use save about 36,000 tonnes/year CO<sub>2</sub>e and reduce kerosene use by 15 million litres per year.

Preliminary studies by SolarAid suggest that kerosene savings may in fact be higher: this will be assessed in detail in a carbon finance evaluation, which is under way.

### Employment

SunnyMoney employs 49 staff (24 female and 25 male) in the four countries where it currently works, 35 of whom are local. The field campaign teams are made up of three or four young graduates, with starting salaries similar to those teachers. The teams work to tight schedules with demanding targets and reporting processes. Staff gain experience in different roles, to share understanding across the organisation, and to give flexibility at times of peak load.

### The future

SunnyMoney is currently launching operations in Senegal and aims to start in another new country before the end of 2013: it has a long-term aim to be active in 24 countries by 2020. In each country, the starting point will be a schools campaign, to raise awareness of the benefits of solar lighting and the SunnyMoney brand, followed by direct sales. After this, the intention is to establish a more permanent local presence by training rural distributors and developing SunnyMoney outlets in small towns. These will sell products like solar lights, efficient stoves and water filters under the SunnyMoney brand, and also provide repair and warranty-fulfilment services at a local level.

Once it reaches profit, SunnyMoney will trade fully as an independent enterprise in the country, with SolarAid an active partner, in particular supporting the solar light sector as a whole and funding research. SunnyMoney will continue to be owned by SolarAid and profits will be re-invested by SolarAid into ventures (including SunnyMoney) that are consistent with the charity's vision of a world where everyone has access to clean, renewable energy.

In the meantime, the biggest current challenge is working capital to fund the purchase of solar lights – which have to be paid for in advance of manufacture and delivery – in order to supply the demand that SunnyMoney is creating.

### Disclaimer

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Jane Mkinga, SunnyMoney project officer, collecting payments from headteachers at Nzera primary school, Tanzania.



A SunnyMoney customer.

**“We’ve just opened a dormitory so that girls can stay at our school. The solar lights will enable them to study more at night and pass their examinations”**

Frimin Kimate, maths teacher, Bugando Secondary School, Tanzania