

Light in the dark



Just 10 years old, Josephine Kwazo already knows hardship. An orphan raised by her grandmother in a rural African village, she desperately wants to succeed in school. But every day after school, Josephine runs home to her chores: carrying water and firewood, tending to the family's goats and cleaning their tiny hut. By 6pm, she hasn't found even a minute to study. With darkness falling and no electricity in the village, the family's kerosene lamp is in popular demand and her schoolwork goes unfinished for another day.

Josephine's story is hardly unique. A shocking 92% of people in sub-Saharan Africa live without electricity, according to UNESCO. In fact, Africa has been dubbed the 'Dark Continent' for its lack of light when seen from space. And when the sun goes down, productivity and day-to-day life come to a near halt – and this includes children's schoolwork.

To salvage a few more hours of light, most rural families turn to kerosene lamps. But these lamps are rife with safety hazards as they often produce more smoke than light, and there are frequent stories of huts – even entire villages – destroyed by fire when the lamps are knocked over. The low-light output, which makes reading difficult, is barely justifiable considering

the high cost of the fuel needed to light them: the World Bank estimates that an average of 10-15% of a family's income is spent on kerosene fuel alone.

Those who can't afford kerosene try to manage in almost total darkness, significantly decreasing the hours of productivity for families already struggling to survive. This can have such a crippling effect that the World Bank recently launched the Lighting Africa initiative, which aims to bring clean-energy, low-cost lighting to 250 million Africans by 2030.

The lack of electricity in rural Africa is such a huge challenge to productivity that many NGOs believe it's one of the reasons >



why Africa has such a hard time escaping poverty and moving forward. And most would agree, to move forward, younger generations need the best education they can get, which means finding a way for them to complete their schoolwork after dark.

LEDing the way

Many experts consider LED lighting to be the best way to light up the region. Extending the electricity grid would be too costly for most cash-strapped African countries and would take many decades, if not generations, to complete. "There is not enough time in the day to extend the electricity grid," says Russell Sturm, head of the Lighting Africa initiative for the International Finance Corporation, a branch of the World Bank. "We need a more immediate solution."

LEDs may be the answer. They're efficient, in that they use a small amount of power yet produce enough light to read and write by. They can also be recharged using natural resources, like solar or manual power. To help achieve the Lighting Africa goal, the World Bank reached out to companies to provide the expertise and technology needed to develop innovative ways of bringing non-fossil fuel lighting sources to Africa. As a leader in LED technology, Philips quickly became involved, with a focus on giving children a better way to continue their studies during the evening.

Education after dark

After school finishes, most African children spend the remaining daylight hours doing household chores. Then, without electricity, they have trouble finishing their schoolwork after night falls – often around 6pm. After-dark lighting could greatly extend their study hours.

"Lots of African children have the drive to succeed at school but not the resources," explains Frank Atta-Owusu, project

manager at KITE, a Ghana-based NGO that has partnered with Philips to get solar-powered lighting to children in rural communities. "Kerosene is not only expensive and dangerous, but usually families can only afford one lamp, and children have the lowest priority. Usually they don't have the chance to use it for their studies. Besides, the light output is so low, it's difficult to read or write."

Facing such challenges, it's easy to see why so many African schoolchildren fall behind in their schoolwork and, often, leave school altogether. UNICEF estimates that while nearly 60% of children in sub-Saharan Africa attend primary school, the number drops to just 21% for secondary school. NGOs on the ground believe that the lack of light at night is part of the reason. Luckily, it's also an area where simple solutions could have a significant impact.

Made for kids

Philips Research began developing a new solar-powered LED light strictly to address the education-after-dark issue. Although there are a number of LED lighting options already on the African market, none are tailored to children and their education. "It's designed for kids so the light is quite safe," explains Roger Ren, the project leader at Philips Research. "Solar powered with just one rechargeable AAA battery, it doesn't run hot or burn their hands. It's also small and sturdy yet simple to use. The light distribution is even and safe for children's sensitive eyes. And because summer storms are common in Africa, the light is waterproof so if left outside, there's no need to worry."

And, of course, the light had to be extremely affordable yet high quality and long lasting. To make the light more environmentally friendly, Philips also worked hard to ensure that almost all the light's parts were recyclable and sustainable.



"What better way to light Africa than with 'clean' renewable energy – using an abundant and natural resource like the sun?" questions Ren. "Solar energy could be the key to bringing light to Africa without serious environmental or health consequences."

A step in the light direction

The hope is that with light, better education will follow. "Since the light is specifically made for educational purposes, we hope that children will be able to use it for studying whenever they want," says Atta-Owusu. "And if they can study more at night and improve their grades, it could help raise educational standards in rural areas."

One case from Senegal proved just how important light after dark can be. In the town of Thiancone Boguel, a school provided free kerosene fuel to local students so they could study after their chores. The effort paid off. In 2005, 100% of the students graduated and nearly all went on to college. But as oil prices rose, the school was forced to stop the program. The following year, just 60% of students graduated, with only 10% going on to college.

Although the education light will initially be available only in Africa, it could someday help other rural communities where low-cost, solar-powered lighting could make a difference in people's lives. And with micro-credit and government-backed lending programs already in the works, families like Josephine's may soon be able to afford a safer, cheaper and more permanent lighting option. And maybe one day her schoolwork will be completed on time – even after dark. ☒

➤ More

Power for the people

The solar-powered education light is part of a larger partnership between Philips and the Dutch Ministry for Overseas Development on a project called Sustainable Energy Solutions for Africa (SESA). Established in mid-2008, SESA's goal is to provide ten million people in ten sub-Saharan countries in Africa with affordable and sustainable energy services for lighting, cooking and water purification by 2015.

While Philips works on the innovative technology, the Dutch ministry is focused on market development, including entrepreneurial training as well as the support and development of micro-lending schemes for the rural communities so that villagers can afford better lighting solutions. "Giving things away for free often proves unsustainable," says Dutch Minister for Overseas Development Bert Koenders. "People in rural Africa currently use kerosene and batteries. They will soon be able to buy solar lamps, paying for them in installments with the help of micro-credit."