

# LIGHTING AFRICA

N E W S L E T T E R

**IN FOCUS**

**High cost of kerosene in Africa’s rural areas could reduce hours of lighting, slow growth**



A health worker examines a patient in a kerosene-lit clinic ©Wilkins/Lighting Africa

Kerosene, which provides lighting for millions of homes across Africa, is not only detrimental to human health and the environment, but also a notable financial burden, a new study just published has found.

The study by the IFC-World Bank Lighting Africa program indicates that the cost of kerosene for rural communities, who typically buy kerosene in small quantities generally much less than a liter, is even higher than previously estimated.

On average, rural households in five Sub-Saharan countries covered in the study pay 35% more for kerosene than their urban counterparts.

The price differential was most stark in Ghana, where kerosene in rural areas retailed at 170% the price in urban centers. In Kenya, kerosene in rural villages costs 46% more than in pump stations in urban areas.

“With world oil prices volatile and generally on the increase, rural families lighting their homes with kerosene lamps will likely be faced with a choice; they will have to decide whether to allocate less money to other daily necessities or to have fewer hours of nightly illumination,” says Jennifer Tracy, lead author of the study titled *The True Cost of Kerosene in Rural Africa*.

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**LIGHTING AFRICA NEWS**

**Quality assurance framework for off-grid lighting goes global**

Lighting Africa’s product quality assurance has gone global after extensive consultation with stakeholders. The global framework expands Lighting Africa’s product quality and performance standards.

The “Lighting Global” quality assurance framework sets the groundwork for an internationally harmonized framework that will meet the information and quality needs of a growing global market for off-grid lighting products.

“Our goal is that off-grid lighting products can be tested once to qualify for the numerous market support and regulation frameworks that exist, reducing transaction costs and simplifying the work of manufacturers who produce good quality products that meet the needs of consumers,” says Dr. Arne Jacobson, Lighting Africa’s Quality Assurance leader.

Lighting Africa will continue to maintain minimum product quality standards and performance targets, while Lighting Global will spearhead the quality assurance testing.

The new global quality framework, which went live on March 28, has four goals:

- Create an appropriate balance between product quality and affordability;
- Use rigorous tests that can be carried out at a reasonable cost;
- Maintain stable and transparent quality assurance policies so stakeholders know what to expect;
- Effectively communicate product performance information so that buyers are able to make informed decisions.

**Minimum Standards**



**Performance Targets**



**Lighting Africa meets 2012 target, but more work needed**

2.5 million people in Africa have embraced the clean, safer solar energy for lighting their homes and businesses abandoning the expensive, hazardous and inefficient kerosene.

But a lot still remains to be done. The 2.5 million people with better lighting represent only 0.4 percent of Africa’s unlit off-grid population.

The IFC head of the Lighting Africa program Itotia Njagi describes the numbers reached with clean lighting so far as “a remarkable achievement” particularly for the beneficiary families.

“However, considering that 99% of the population still relies on kerosene clearly underscores the magnitude of the effort required, and the additional players needed to scale up clean energy in Africa,” he says. “Everyone has a role to play.”

Since its establishment in September 2007, Lighting Africa has raised awareness and catalyzed interest in solar lighting among consumers, manufacturers and distributors resulting in 500,000 high quality solar lamps being sold in Africa.

Solar lighting products are displacing kerosene and other inefficient, polluting fuels from rural homes, saving families considerable amounts of money, improving school performance and unlocking the rural entrepreneurial spirit through increased productive economic hours per day. The program’s main challenge is mobilizing financing for the entire solar products’ supply chain – manufacturers, importers and retailers.

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The study, which covered Tanzania, Senegal, Mali, Kenya and Ghana, compared the pump price of kerosene in urban centers, which traditionally has been used to estimate the cost of kerosene for rural consumption, to the retail price of kerosene found in rural areas.

The findings provide a strong economic justification for rural communities not connected to electricity grids across Africa to explore cleaner lighting alternatives for their homes and families such as solar-powered lamps.

Many people across the continent, especially in rural areas not connected to national grid electricity use kerosene because it is an accessible option. Previous estimates of this financial burden on rural consumers captured the costly necessity.

The study also found that at the current levels of expenditure on kerosene, rural families could more affordably switch to solar lamps bought using loans, and repay the loans in much shorter periods than had been earlier estimated.

That communities are spending more than previously computed, means they would repay 'lighting loans' faster if they dedicated their current kerosene expenses towards servicing their loans.

The findings show that a \$20 solar lamp, for example, would in rural areas be paid off in about 8 months compared to the previously estimated 11 months, enabling families to enjoy cleaner, safer, higher quality domestic lighting sooner.

The findings of the full study have been published on the Lighting Africa website, and are freely available.

## STORIES FROM THE FIELD

### Solar lanterns light up Mafia Island

After a successful project to increase students' access to better quality studying light last year, the NGO Solar Aid is back to Tanzania's Mafia Island.

Solar Aid initiated a second solar lighting project through its social enterprise arm, SunnyMoney, targeting the broader Mafia community.

Last year Solar Aid, in partnership with d.light, concluded the initial project that increased students' access to safe, bright light with a record sale of 3,000 solar lamps in one week.

"We don't have electricity, so this program has especially helped children to study in the night without the risk of fire and the expenses of buying kerosene and candles. Solar lamps are simple to use; you just charge in the day and use in the night," said one headmaster at a school in the Kilindoni area of Mafia Island.

The second project has already doubled last year's sales. It is estimated that 44% of households on Mafia Island now own at least one solar lamp.

"We do not know of any other place in the whole of Africa where over 40% of households own a solar lamp! For us, this is a glimpse of Africa's future," says John Keane, SunnyMoney's Managing Director.

SunnyMoney is currently rolling out more student lamp campaigns in Arusha and Kilimanjaro.

## Building product screening know-how for western Africa

In the nuclear sciences department of the University of Nairobi, five men are packed inside a tiny darkened laboratory that tests off-grid lighting products seeking entry into the African market. Inside black curtains are drawn around a light bulb shining onto a black wall marked with white crosses.

The men, two Kenyans and three Senegalese, are deep in discussion about how to measure the brightness of the light by rotating the bulb carefully through 360°. The results will be recorded on a spreadsheet and compiled into a product quality report.

The Senegalese are experts from the Senegal Rural Electrification Agency (ASER) and Center for Renewable Energy Studies and Research (CERER); they were in Nairobi for hands-on technical training on product screening in preparation for a new laboratory for western Africa.

"Torches sold by the roadside often look nice; smart on the outside with bright colored casings, but when you take them apart the wiring inside is poor, there is a cheap battery and a metal rod has been put inside to add weight," says James Wafula, the head of the University of Nairobi lighting laboratory. "It is important to screen to prevent poor products spoiling the name of the young solar industry."

The brightness test is one of basic tests portable solar lighting products seeking the Lighting Africa quality certification are put through during an initial six-week screening process that is used to verify whether or not a product passes a basic quality and performance assessment. Initial screening looks at product durability (by dropping a product from one-meter high to see if it can withstand the fall), brightness quality, how long the solar lamps retain their brightness, and battery lifespan, among other attributes.

Currently, quality screening of off-grid lighting products is done only at the University of Nairobi. Coming soon however, is another laboratory at the Center for Renewable Energy Studies and Research (CERER) in Dakar, Senegal.

Initial screening is followed by more extensive, four-month product quality and performance tests at international test labs for products aspiring for Lighting Africa quality standards, which enhance product marketability, and assures consumers of product quality.

"The key to successful market entry is low-tech but thorough testing," says Chris Carlsen, an off-grid lighting specialist with the Lighting Africa program.



One of the Senegalese quality assurance experts takes apart a solar lamp during the training at the University of Nairobi

### Solar lamps changing lives on Mafia Island

An assessment of the initial project found that:-

All of the households that purchased a solar lamp were using it for studying, working or general lighting in the evenings, or for a combination of the three uses.

Nearly all of households reduced their kerosene use as a result of acquiring solar lamps.

Parents reportedly said that their children's academic performance had improved 'a lot' as a result of purchasing and using solar lamps.

84% of head teachers reported improvement in exam results amongst students who used solar lamps to study.

Students reported that their entire families were benefitting from lighting from the solar lamps.

These findings spurred Solar Aid to develop and undertake a second phase of the project in Tanzania's Mafia Island.

### New lumen maintenance testing technical brief is now available

Lighting Africa has released a new technical brief on LED lumen maintenance testing that is now available on the website.

The new technical note focuses on simple, low-cost devices that can be used to measure LED lumen maintenance.

The brief is a useful reference for lighting designers, manufacturers, and others who seek to learn more about the principles and practice of lumen maintenance testing.

### Lighting Africa develops 'Market Check' testing policy

Lighting Africa has developed and released a new policy that outlines the procedure for randomly and anonymously conducting market check tests to verify the quality and performance of off-grid products sold in Africa.

The policy will ensure that the quality and performance of products in the market are consistent and match advertised information. The tests will be done at Lighting Africa's cost.

Products that fail to meet minimum quality standards or prior Lighting Africa test results will be subjected to additional, more thorough testing. Failure to still meet standards will result in loss of the product's quality assured status (Associate status).

### Poor People's Energy Outlook 2012

UK charity, Practical Action released its biennial Poor People's Energy Outlook Report, which projects that by 2030, in a "business as usual" scenario;

- 900 million people will not have access to electricity,
- 3 billion people will still cook with traditional fuels,
- More than 30 million people will have died due to smoke-related diseases,
- Many hundreds of millions will be confined to poverty as a result of poor energy access.

### Tracking Clean Energy Progress Report

The 2012 Tracking Clean Energy Progress report has been released by the International Energy Agency.

The report measures progress in the global development and deployment of energy-efficient and clean energy technologies such as solar lamps.

The report notes that significant progress has been made in the development and deployment of solar and wind technologies.

For more information, visit the International Energy Agency website.



Poor people's energy outlook 2012



## ANNOUNCEMENTS

### Registration for the third off-grid lighting conference opens

The Lighting Africa and Lighting Asia programs, in conjunction with the Rural Electrification Agency of Senegal (ASER), are pleased to announce that registration for the third International Off-Grid Lighting Conference and Trade Fair is now officially open.

The conference will be held November 13-15, 2012, in Dakar, Senegal.

The event will provide participants with critical industry insights on off-grid business and technology matters, including product quality standards and certification.

It will showcase innovative business and service delivery models for tapping into the multi-billion dollar off-grid lighting market and provide market intelligence on consumer trends and preferences.

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### Tanzania: 'Word of Honor' credit scheme improves access to lighting

For rural communities without electricity, lighting the home can be costly and challenging.

Although well priced modern solar products are now available on the market, their cost is often beyond the reach of many rural low-income households.

The NGO Appropriate Rural Technology Institute of Tanzania (ARTI-TZ) has figured out how to provide credit to help rural consumers buy solar lamps.

Using a system known as 'Mali Kauli' (Word of Honor, in Swahili), the NGO is providing village-level credit to enable families invest in solar lighting products using their word as security for loan repayment.

The NGO encourages beneficiaries to repay their loans using the savings made from no longer having to buy kerosene.

This credit system has been in use in Tanzania and has helped poor families buy bicycles, corrugated roofing iron sheets, cement, seeds and fertilizers.

"The 'Mali Kauli' system is already in place and is well known to consumers. Customers are keen to pay back what they owe in order to get more credit to buy yet more products," says Nachiket Potnis, CEO of ARTI-TZ.

ARTI-TZ's Mali Kauli solar lamps' distribution strategy was piloted in Bagamoyo, but has since been rolled out to other parts of the country.

The NGO is supplying more than 13 dealers and wholesalers with Barefoot Power solar lighting products.

ARTI-TZ is also working with savings and credit cooperative societies and other microfinance institutions to ensure lanterns suppliers or distributors can access finance to meet consumer demands.

ARTI-TZ is one of ten grant recipients of the Lighting Rural Tanzania (LRT).

Lighting Rural Tanzania is a grant competition organized by the Tanzania Rural Energy Agency, with support from the World Bank and Lighting Africa. It promotes innovative business models for the provision of off-grid lighting to the rural areas of Tanzania.

## New manufacturers qualify to join Lighting Africa's Associate program

Six new manufacturers of modern, portable off-grid lighting products have successfully put a number of their products through the rigorous Lighting Africa quality assurance process.

These manufacturers now qualify to apply to become Associate members of the Lighting Africa business support program, which provides business-to-business linkages that facilitate market entry and product marketing.

Each of the companies' products now has third-party verified quality and performance from Lighting Africa's standardized product specifications. These new products bring to 30 the number of off-grid lighting products that have so far passed the Lighting Africa product quality and performance tests.

The new companies whose products passed the Lighting Africa quality standards and performance targets are:

- Global Telelinks with the Prakruthi Power Arundhati Solar LED Lantern
- Deutrex 818 with the Foce Solar Lamp
- Nuru Lights with a mechanical pedal-charged lamp, the Nuru Light + PowerCycle
- Schneider Electric with three solar home lighting systems
- Trony Solar Holdings with their new two-lamp home lighting kit – TSL-02
- Nokero International Ltd with its new product, the Solar Light Bulb.

### Impact of Solar lanterns in the Philippines

A distributor of the SunTransfer2 (ST2) solar lamp in rural Philippines, Hybrid Social Solutions inc (HSSI) has undertaken a social impact assessment of the solar lamp with illuminating findings.

The study is poignant because HSSI uses a similar distribution model of the ST2 lamp, manufactured by the German company Sun Transfer, as that used in Kenya; through micro-finance institutions.

The study found that 90% of the ST2 lamp customers bought it for better lighting.

Before introduction of the ST2 lamp, 84% of the respondents relied on kerosene lighting but this dramatically declined to 33% after the introduction of the lamp.

Likewise, the use of battery-powered torches (flashlights) dropped from 69% to 29%, while candle use declined from 19% to 5%.

Those who continued to supplement solar lighting with kerosene lamps reported huge reductions (about 80%) in kerosene consumption.

The study also found that 70% of solar lamp owners now charge their phones using solar energy compared to only 5% prior to the ST2, and the proportion of people who charged their phones at commercial charging stations with electricity connections declined from 58% to 13%.

The assessment was undertaken by Planète d'Entrepreneurs, a student organization funded by the HEC Paris Business School and corporate firms in France.

It used a novel methodology that employs the social return on investment (SROI) which considers and incorporates social and environmental costs and benefits, alongside the standard economic considerations.

It examined the impact of the solar lamps on overall quality of life, and impact on children's education. It also examined the experiences of the microfinance distributors thereafter making recommendations on how to market, sell and use the lamp. The full findings are available on the Lighting Africa website.



A mother, child and their ST2 portable solar lamp; the lamps have dramatically reduced reliance on kerosene for lighting  
Photo: Planète d'Entrepreneurs



The **Lighting Africa Newsletter** is a briefing on the latest developments in the Lighting Africa program and the off-grid lighting market. It is provided to all organizations and individuals in the Lighting Africa network. Help us help you tell your story by sending us your articles!

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Lighting Africa, a joint IFC and World Bank program, seeks to accelerate the development of commercial off-grid lighting markets in Sub-Saharan Africa as part of the World Bank Group's wider efforts to improve access to energy. Lighting Africa is helping mobilize the private sector to build sustainable markets to provide 2.5 million people with safe, affordable, and modern off-grid lighting by 2012. The longer-term goal is to eliminate market barriers for the private sector to reach 250 million people in Africa without electricity, and using fuel based lighting, by 2030. Improved lighting provides significant socio-economic, health and environmental benefits such as new income generation opportunities for small businesses. Lighting Africa is a key element of the global Solar and LED Energy Access (SLED) program, an initiative of the Clean Energy Ministerial.

For more information, please visit <http://www.lightingafrica.org>

Lighting Africa is implemented in partnership with: The Africa Renewable Energy and Access Grants Program (AFREA) • The Asia Sustainable and Alternative Energy Program (ASTAE) • The Energy Sector Management Assistance Program (ESMAP) • The Global Environment Facility (GEF) • The Good Energies Inc. • Italy • Luxembourg • The Netherlands • Norway • The Public-Private Infrastructure Advisory Facility (PPIAF) • The Renewable Energy and Energy Efficiency Partnership (REEEP) • The United States.

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