

Lighting Africa Progress Report

1 July 2010 - 30 June 2011



LIGHTING  AFRICA
Catalyzing Markets for Modern Lighting

AN INNOVATION OF

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Lighting Africa

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 to 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 socioeconomic, health, and environmental benefits such as new income generation opportunities for small businesses. Lighting Africa is a key participant in the global Solar and LED Energy Access program, an initiative of the Clean Energy Ministerial.

Lighting Africa is implemented in partnership with the Africa Renewable Energy and Access Grants Program, the Asia Sustainable and Alternative Energy Program, the Energy Sector Management Assistance Program, the Global Environment Facility, Good Energies Incorporated, Italy, Luxembourg, the Netherlands, Norway, the Public-Private Infrastructure Advisory Facility, the Renewable Energy and Energy Efficiency Partnership, and the United States.

For more information, visit www.lightingafrica.org.

The World Bank

The World Bank is a vital source of financial and technical assistance in developing countries worldwide, with a mission to help reduce global poverty and improve living standards. However, it is not a bank in the common understanding of the term. Rather, it is comprised of two unique development institutions owned by 185 member countries—the International Bank for Reconstruction and Development and the International Development Association. Each institution plays a different but supportive role.

The International Bank for Reconstruction and Development focuses on middle income and creditworthy poor countries, while the International Development Association focuses on the world's poorest countries. Together, they provide low-interest loans, interest-free credit, and grants to developing countries for education, health, infrastructure, communications, and many other purposes. The World Bank concentrates on building the climate for investment, jobs, and sustainable growth to enable economies to grow, and investing in and empowering poor people to participate in development.

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For more information, visit www.ifc.org.

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The period covered by this report marked an important turning point for Lighting Africa. The sales of quality off-grid lighting products in Africa grew by 450 percent over the year — providing nearly 1.5 million people with better lighting and improved energy access. To date, over 90 modern lighting products have been tested by the program, with 25 passing quality benchmarks. These products are priced between \$15 and \$100.

The first Lighting Africa laboratory was set up in East Africa at the University of Nairobi in Kenya to test off-grid products for manufacturers and distributors. A second laboratory is being set up in Dakar, Senegal, focusing on West Africa.

The governments of Ethiopia, Mali, and Senegal have signed agreements with Lighting Africa to integrate the program into their rural energy projects. In addition, an eight-country study lays out policy and regulatory barriers to off-grid lighting, and discusses pragmatic solutions to overcome these obstacles.

New financial products are being developed to support manufacturers, distributors, and consumers, leveraging IFC's financial services in the region.

Building on experience gained in pilot operations in Kenya and Ghana, Lighting Africa is expanding its activities across the continent with more streamlined, packaged services that can be modified based on local needs, and scaled up with minimum input.

The Global Off-Grid Lighting Association has been created to help make Lighting Africa a self-sustaining operation and expand its coverage to other regions. The association has established a board of directors, created a business plan, secured its first tranche of funding, and is seeking incorporation as a non-government organization.

After nearly five years in operation, Lighting Africa recently had its first independent mid-term review. The findings were largely positive – demonstrating Lighting Africa's efforts to advance a quality, sustainable off-grid lighting market to effectively serve people who do not have electricity. Areas that need improvement are being addressed.

With 330,000 households across Africa using solar lanterns, the goal to reach 500,000 households with clean, safe lights by 2012 will be achieved. This will contribute to the universal access targets of the United Nations (UN) Secretary General's Sustainable Energy for All initiative for 2030.

We want to thank all our donors, partners, and associates for their ongoing support. We look forward to strengthening this collaboration in the period ahead.



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Acronyms

CDM.....	Clean Development Mechanism
CFL.....	Compact fluorescent lamp
FY	Fiscal year
LED.....	Light-emitting diode
NGO.....	Nongovernmental organization
SMEs.....	Small and medium enterprises
UN.....	United Nations

1. Overview

Lighting Africa, a joint IFC and World Bank program, is working with the private sector to build sustainable markets that provide safe, affordable, and modern off-grid lighting to communities in Africa that do not have access to electricity. To date, Lighting Africa and its stakeholders have provided close to 1.5 million people with cleaner, safer, better lighting and improved energy access. The program aims to increase energy access and provide superior lighting to 2.5 million people by 2012, and 250 million by 2030.

Proper lighting is a basic need, the absence of which hinders social and economic development. Yet nearly 600 million people in Africa—about 70 percent of the population – lack electricity and rely on expensive, polluting, and dangerous fuel-based lighting such as kerosene lamps and candles.

There are alternatives to fuel-based lighting for people not yet connected to the electricity grid, especially in remote rural areas. Even people who are connected to the grid have lighting challenges – many grid connections are unreliable and intermittent, with frequent power outages and blackouts.

Lighting Africa works to make modern off-grid lighting products accessible to low-income households and small and medium enterprises (SMEs) in Africa. Compact fluorescent lamps (CFLs) and light-emitting diode (LED) lamps are clean, high-quality solutions. These products offer better illumination, longer battery life, and can charge cell phones or other small electronic devices. They are also becoming more affordable.

Africans spend about \$10.5 billion on kerosene for lighting every year. This represents a vast, largely untapped opportunity for the global off-grid lighting sector. However, this emerging market is hard to penetrate. Manufacturers struggle to find business partners, and financial institutions, which are unfamiliar with the industry, are unable to exploit the market's growth potential. In addition, consumers have not yet embraced new technologies, because they largely lack awareness, and low-quality products threaten to undermine consumer confidence.

Lighting Africa works with manufacturers, distributors, consumers, financial institutions, development partners, and governments to remove these and other market obstacles. The program currently operates in Ethiopia, Ghana, Kenya, Mali, Senegal, and Tanzania.

Global market acceleration in fiscal year 2011

- Off-grid lighting sales grew by 450 percent across Africa.
- The variety and choice of affordable, quality products to off-grid consumers has increased, with prices ranging from about \$15 to \$100.
- A variety of new players are entering the marketplace – 18 manufacturers have products that have passed quality tests.³
- Consumers are better equipped to make buying decisions in today's market, through consumer education and quality assurance activities.

³ See in Appendix 1 the list of products that pass Lighting Africa's minimum quality standards, meet the recommended performance targets and are currently available in Africa.

About Lighting Africa

The program aims to:

- Demonstrate market viability – Lighting Africa supplies companies and investors with intelligence on market size, consumer preferences and behavior, and “base of the pyramid” business models and distribution channels.
- Remove market barriers and improve the enabling environment – Lighting Africa has developed a quality assurance program, facilitates business-to-business partnerships through conferences, workshops, and a dedicated website, and works with governments to make the policy environment favorable for off-grid lighting markets.
- Build sustainable off-grid lighting markets – Lighting Africa supports the scale-up and replication of successful businesses and business models. It provides business development services for its associate companies, helps distributors and retailers access finance, supports the Global Off-Grid Lighting Association, and helps governments integrate off-grid lighting into their electrification programs.

Lighting Africa works to realize the objectives set out below.

Market-based approach:

Lighting Africa works with both the public and private sector to transform the off-grid lighting market and make it sustainable. The program advances the market through a combination of policy support and business development. These interventions are intended to be a temporary catalyst – when the initial barriers are overcome, the market should become self-sustaining. Over time, the role of governments and Lighting Africa will diminish as market forces take over.

Increased energy access through household lighting solutions:

Lighting Africa promotes lighting technologies designed specifically for households living without electricity. Lighting provides health, education, and safety benefits. Lanterns are an inexpensive way to quickly improve the quality of life for people living off-grid. Not only does the lantern save costs, but it can also improve communication in rural areas through its cell phone charging capabilities. Centralized or mini-grid connections are still the end goal, but off-grid lanterns and other lighting devices are a first step in moving up the energy ladder.

Focus on results and outcomes:

The goal is to eliminate market barriers for the private sector, so that by 2030, 250 million Africans will have affordable modern lighting. The program aims to distribute 500,000 quality, clean, and safe lights to African households and businesses by 2012 (benefiting 2.5 million people). This target is expected to be exceeded. The long-term goal is also achievable, but significant scale-up is required.

Support for innovation:

Lighting Africa leverages efficient and renewable technology advancements. Renewable power sources enable the lanterns to be off-grid and available at lower costs, but it is the efficiency improvements that drive the market. A recent report on solar lighting in Africa predicted a 40 percent drop in costs within the next five years.¹ This is based largely on decreasing costs and increasing performance of LEDs and batteries. Overall, lanterns are becoming more affordable, useful, and environmentally friendly. At today's cost, lanterns in 2015 will deliver light that is two to three times brighter. The variety of quality products in the market is also increasing.

Alignment with climate change mitigation:

The UN Framework Convention on Climate Change has adopted Lighting Africa's test methods to qualify off-grid lighting products for use in Clean Development Mechanism (CDM) projects. Eligible projects will receive carbon credits for reduced greenhouse-gas emissions, primarily from the displacement of kerosene.

¹ Source: Lighting Africa, *Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market*, Nairobi, Kenya, 2010.

Energy for sustainable development

“Energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development—social, economic, and environmental— including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues. None of the Millennium Development Goals can be met without major improvement in the quality and quantity of energy services in developing countries.” – UN Development Program (<http://www.undp.org/energy/>)

Lighting Africa works to improve and expand energy access for the poor across Africa. Enhanced lighting provides significant socioeconomic, health, and environmental benefits, such as new income generation opportunities for small businesses, longer and better illumination for studying, extended productive hours in the home, as well as reduced indoor air pollution and greenhouse-gas emissions.

Support for global energy access goals:

By accelerating clean energy technologies in developing countries, Lighting Africa’s work is helping to achieve the Millennium Development Goals. The program is also a key element of the Solar and LED Energy Access program, an initiative of the Clean Energy Ministerial – a global forum that encourages the transition to a clean energy economy. The UN General Assembly designated 2012 as International Year of Sustainable Energy for All. Lighting Africa’s efforts contribute to achieving this objective as well.

Partnerships:

Donors and nongovernmental organizations (NGOs) are recognizing the potential of modern off-grid lighting products, such as solar lanterns and micro solar home systems, to address the energy access gap. As a result, the number of donor programs that promote solar lanterns and other clean, modern, off-grid lighting products is increasing.

To avoid duplication and align development approaches, Lighting Africa coordinates its activities closely with other international organizations and donors, including the German Gesellschaft für Internationale Zusammenarbeit, the UN Environment Program, the UN Development Program, the UN Industrial Development Organization, the United Kingdom Department for International Development, the Energy Resources Institute, and the Global Village Energy Partnership.

Lighting Africa also works with the Africa Renewable Energy and Access Grants Program, the Asia Sustainable and Alternative Energy Program, the Energy Sector Management Assistance Program, the Public-Private Infrastructure Advisory Facility, the Global Environmental Facility, Good Energies Incorporated, the Renewable Energy and Energy Efficiency Partnership, and the governments of Italy, Luxembourg, the Netherlands, Norway, and the United States.

Global Off-Grid Lighting Association:

The association was launched in May 2010 with the signing of a Green Paper/Letter of Intent by 24 Lighting Africa member associations during the second Lighting Africa International Business Conference and Trade Fair in Nairobi. The association will help Lighting Africa become a self-sustaining operation. It also provides an exit strategy for the World Bank Group, which jump-started the off-grid lighting industry and market. The association, with Lighting Africa support, has made progress in establishing itself as a formal organization. It is expected that incorporation will be completed in early 2012.

2. Key Accomplishments

Lighting Africa lowers entry barriers to the off-grid lighting market, from the design of lighting products, to their production and distribution. Lighting Africa works in six areas.

Quality assurance

Product testing and performance verification

To date, 94 off-grid lighting products have been tested by independent third-party laboratories, with 25 passing the minimum quality standards (binding) and the majority also passing the recommended performance targets (optional).² This year, a greater portion of the products submitted for testing passed the quality standards, increasing the number of available quality products in the market. While low-cost and poor-quality products continue to be sold, affordable solar lanterns which have passed Lighting Africa quality tests are rapidly gaining market share. A listing of products that pass Lighting Africa's minimum quality standards, meet the recommended performance targets and are currently available in Africa appears in Appendix 1.

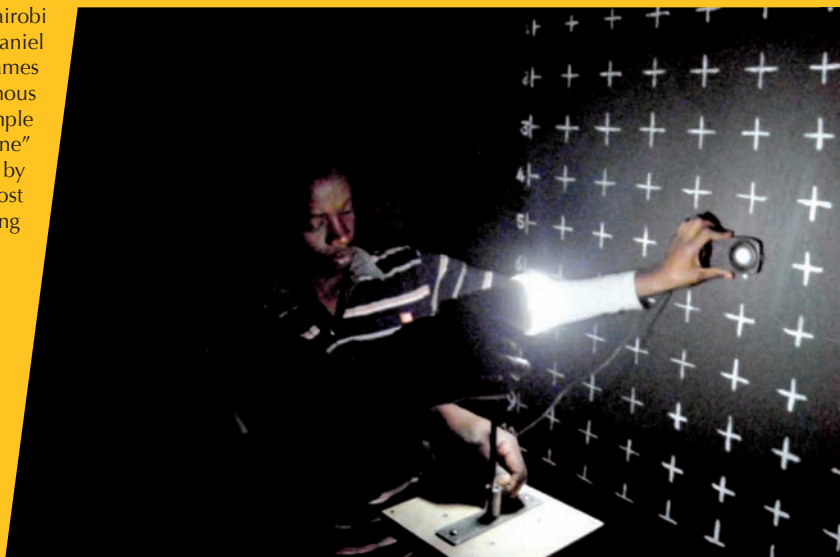
Standardized specification sheets

Finding ways to help manufacturers communicate about their products effectively and credibly is key to overcoming early market spoilage in the off-grid lighting space. Lighting Africa is building a framework to provide transparent, relevant, and verifiable quality and performance information to buyers, ranging from rural consumers to international bulk purchasers. In response to broad demand, Lighting Africa has developed a standardized specification sheet program, which provides this information for free in detailed, comparable formats. Specification sheets are available at www.lightingafrica.org/specs.

Test laboratory capacity building

The quality assurance program builds capacity for international test laboratories to carry out Lighting Africa product tests, including local laboratories in Africa. The University of Nairobi in Kenya conducted off-grid lighting testing services for the program. Support included training of laboratory technicians, equipment provision, and several rounds of validation testing to ensure that the lab was able to produce consistently accurate results. The lab is the first of its kind in East Africa to offer local product testing as a commercial service. A second lab is being developed at the Center for Study and Research on Renewable Energies in Senegal. Lighting Africa has also been working with the Lighting Research Center in Troy, New York; the Fraunhofer Institute for Solar Energy in Freiburg, Germany; and the Schatz Energy Research Center in Arcata, California, to test international products using Lighting Africa's quality test method.

At the University of Nairobi Lighting Laboratory, Daniel Njoroge (pictured) and James Wafula measure the luminous flux of a lighting sample using the new, "multi-plane" method developed by Lighting Africa for low-cost testing



Technical advisory services

As part of its quality assurance program, Lighting Africa seeks to identify systematic quality and performance issues. While solutions can be found, manufacturers sometimes lack the capacity to carry out the research required. To address this, Lighting Africa publishes a series of technical briefing notes that focus on issues related to the design or manufacture of off-grid lighting products.

² The minimum quality standards focus on truth in advertising and adherence to basic quality criteria, but do not include minimum performance requirements for run-time or light output. Meeting the recommended performance targets requires that a product passes the minimum quality standards in addition to meeting specific performance run-time and light output targets. Distinguishing between the two quality benchmarks enables Lighting Africa to maintain quality standards, while encouraging technological innovation by recognizing that market segmentation requires a range of product prices and performance levels.

Three briefing notes were published in fiscal year 2011 (FY11):

- Specifying LEDs: How to Read an LED Data Sheet
- Interpreting Standardized Specifications Sheets
- Optical Control Techniques for Off-Grid Lighting Products

Quality seal

Quality testing results are primarily meant to help companies find business partners and secure financing. Over half of interviewed distributors and manufacturers suggested that the quality assurance and consumer education components would have significantly more value if they have a certification seal for approved products, as has been done for other market transformation programs such as the Efficient Lighting Initiative and the Photovoltaic Global Approval Program. Lighting Africa is working to establish a stand-alone, global quality seal for off-grid lighting products. Opportunities for a commercially sustainable seal and associated governance structures are being evaluated. The US Department of Energy is providing technical assistance and funding.

Sustainable quality assurance initiative

The U.S. Department of Energy is also leading an effort to ensure that the quality assurance program developed through the Lighting Africa initiative is sustainable. A plan is being created to communicate quality along the supply chain through a seal for off-grid lighting systems. The Department's efforts take place in the context of the Solar and LED Energy Access initiative, which involves a partnership with IFC.

Product award launch

Winners of the Lighting Global 2012 Outstanding Product Awards competition will be announced at the third International Off-Grid Lighting Conference and Trade Fair in Dakar, Senegal, in late 2012. More information is available at www.lightingafrica.org/awards.



Business support services

Market creation for innovative products

By removing market obstacles for a range of players, Lighting Africa has contributed to substantial market transformation, resulting in 450 percent growth over the reporting period.

Multi-tiered business support system for partners

A three-tier business support system has been established to provide companies with additional advisory services as they deepen their market commitment, improve product quality, and meet other criteria:

- Network services provide basic networking opportunities and access to Lighting Africa's public resources. These are open to all stakeholders in the lighting industry.
- Associate services bring transparency to the market and advertise quality products. These services include help with new market entry, access to financing, and promotional activities. They are available to organizations meeting Lighting Africa's requirements. All companies with products that have passed the minimum quality standards are invited to apply to become program associates. Associate business services are outlined in Figure 1.
- Extended associate services provide consumer outreach support. These services are available only to companies with products that satisfy Lighting Africa's performance targets, in addition to having passed the minimum quality standards.

Manufacturer/distributor support for improved product designs

In FY11, 14 manufacturers, 12 distributors in Kenya, and five distributors in Ghana received Lighting Africa business support services to help improve their products.

Bulk purchasing agreements with companies and NGOs

Negotiations are underway to establish agreements with a number of qualified companies in Kenya and Ghana to support the bulk purchase of products that meet Lighting Africa's recommended performance targets. These include Faulu, Techno Serve, the Ghana Electrical Dealer Association, and Unilever Tea Kericho Limited. In addition, partnerships are evolving with other major organizations including TOTAL, the French oil and gas company, which is now operating in off-grid lighting markets in Cameroon, Kenya, and Indonesia, and the Global Association of Mobile Operators, which is planning a roll-out of about 100 pilot off-grid lighting projects in Burundi, Rwanda, Tanzania, and Uganda.

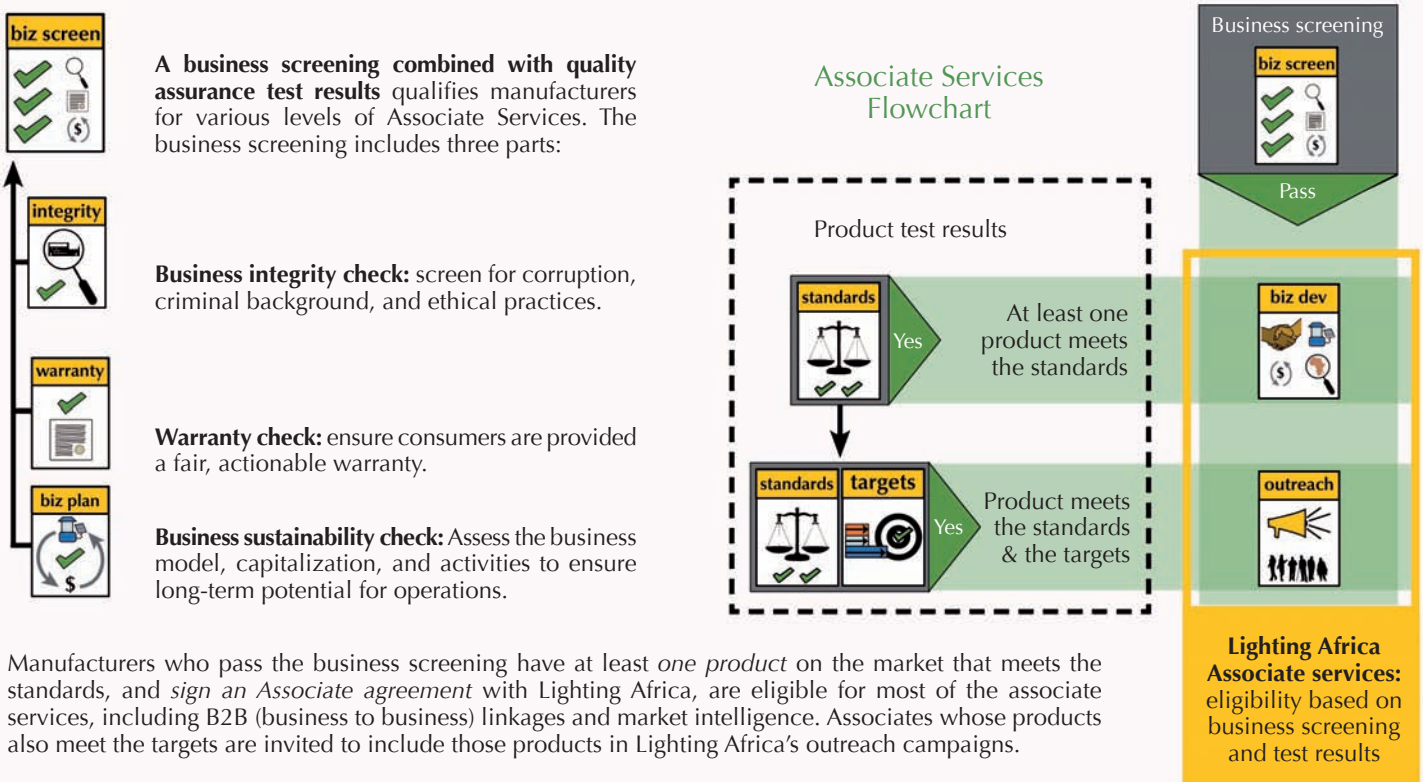
Communications and networking

The Lighting Africa website continues to expand as a major online resource for the growing industry. Enhanced network services reach 1,920 member organizations and over 2,550 individual members. Average hits per month exceed 34,000.



Figure 1: Associate services

All companies with products that have passed the performance targets and/or the minimum quality standards are invited to submit an application to become a program associate.



Manufacturers who pass the business screening have at least *one product* on the market that meets the standards, and *sign an Associate agreement* with Lighting Africa, are eligible for most of the associate services, including B2B (business to business) linkages and market intelligence. Associates whose products also meet the targets are invited to include those products in Lighting Africa's outreach campaigns.

The following table depicts the services available to all associates, as well as extended services available to products meeting the program's recommended performance targets.

Table 1: Associate services

Lighting Africa associate services		Associate services	Extended associate services
Business to business match-making	Introductions between trade groups / distributors / manufacturers / financial institutions	✓	✓
	Trade fair participation and associated promotions	✓	✓
Sector-level business support services	After-sales service and maintenance training to wholesalers/retailers	✓	✓
Cost-shared business support services activities	Retail audit / sales tracking (selected markets only)	✓	✓
	Key account management	✓	✓
	Analysis and evaluation feedback on business plans	✓	✓
	Supply chain strengthening	✓	✓
	Marketing support	✓	✓
Product development	Subsidized product submission for quality test methodology	✓	✓
Consumer outreach services	Products featured on website with link to companies		✓
	Participation in marketing/consumer awareness programs		✓
	Invitation to consumer awareness activities		✓
	Offer of media rate discounts		✓
Visibility in Lighting Africa communications	Standard specification sheet	✓	✓
	Impact story for website/bi-monthly newsletter	✓	✓

Access to finance

Microfinance institutions

To address the upfront cost bottleneck for consumers, Lighting Africa has reached out to microfinance institutions to provide consumer finance. Three institutions in Kenya and two in Ghana are providing finance to consumers in rural areas.

Risk guarantee facility

Lighting Africa is developing a risk guarantee facility for modern lighting products with the Bank of Africa. The Bank is also offering a line of credit to distributors that have met preconditions of the IFC risk facility.

Inventory facility for manufacturers

Lighting Africa is establishing an inventory facility for manufacturers with commercial banks in China. The facility aims to reduce product inventory lead times to Africa by three to four weeks by ensuring that manufacturers have adequate stock to meet growing demand.

Leveraging existing finance facilities

Lighting Africa helps its clients link to existing financing sources, including IFC's Sustainable Investments program and private equity firms.

Clean Development Mechanism

The recently updated UN Framework Convention on Climate Change CDM methodology prequalifies any product that meets the Lighting Africa standards and targets for CDM projects. This makes Lighting Africa's quality test methodology the easiest entry path for off-grid lighting carbon finance.

Several companies are exploring business models that take advantage of these credits, as well as other climate finance options, to ensure that the off-grid lighting sector benefits from carbon revenues. Lighting Africa will continue to help associates and the market in general with carbon financing, including the development of a briefing note with a simple breakdown of the way CDM and off-grid lighting works.

Green energy loans

Microfinance institutions in Ghana are leading efforts to bring affordable solar lighting to the poor. The Christian Rural Aid Network aims to provide energy loans to 20,000 people over the next 18 months. "The success of our initial piloting showed demand is so enormous that we intend to replicate our program in many areas of Ghana," says Dr. Patrick Agbesinyale, Executive Director of the Christian Rural Aid Network Microfinance.

The Christian Rural Aid Network provides loans with the support of Impact Energies Ghana. The Network delivers innovative financing, supply, and distribution support to microfinance organizations.

Market intelligence

Market research synthesis report

Lighting Africa prepared a report that provides lighting manufacturers, assemblers, and distributors with in-depth knowledge to help them enter the market, tailor their products to consumer needs, and make informed market development decisions. The report provides data on consumer characteristics, consumer feedback on various lighting products, market size estimates, and the findings of extensive consumer studies in Ethiopia, Ghana, Kenya, Tanzania, and Zambia, including product trial results and over 10,000 interviews with potential consumers.

Market trends

Lighting Africa conducted several research studies on market trends and applications for off-grid lighting. Recent reports include Solar Lighting for the Base of the Pyramid—Overview of Emerging Trends, LED Lighting for Chicken Production, and Expanding Women's Role in Africa's Modern Off-grid Lighting Market.

Information sharing

Lighting Africa provided education workshops and business development support to link manufacturers with distributors, and to help establish rural distribution networks.

Improving rural distribution in Kenya

In August 2010, only 30 retail outlets in Kenya were selling products that passed Lighting Africa quality testing, with 95 percent of the vendors in electrical shops. Entrepreneurs quickly realized that to reach scale they needed to engage many other types of distributors, particularly those successful in remote rural and other hard-to-reach markets. With Lighting Africa support, there has been a substantial increase in both distribution and geographical reach. Today, over 250 retail outlets in the country carry off-grid lighting, including supermarkets, rural consumer goods shops, and grocery stores. New and unconventional vendors for these products are springing up all over rural Kenya with surprising momentum.

Getting to know the market

- 1.6 billion people globally live without access to grid electricity—589 million in Africa.
- In 2009, only 35 percent of Africa's population had grid connections.
- Of Africa's on-grid population, over a third experience frequent blackouts.
- African poor rural households and SMEs spend \$10.5 billion on kerosene for lighting every year. Of this, \$8.2 billion is due to Africa's 110 million off-grid households. This spending is expected to grow to over \$12.5 billion by 2015.
- Kerosene is the dominant energy source for off-grid lighting in Africa. It is the primary light source for 53 percent of households and accounts for nearly half the total expenditure on lighting.
- Market penetration for solar portable lights in Africa is likely to increase from 0.5 percent to 8 percent by 2015.
- The manufacturing cost of solar portable light is estimated to drop by 40 percent by 2015.
- Modern lighting could address lighting needs of 49 percent of off-grid homes in Africa (54 million households).
- New features of modern lighting products include multiple recharge options, battery life notification, flexible mounting features, increased durability, and cell phone chargers.
- Lack of financing, high taxes, tariff burden, market spoilage by sub-standard products, low consumer awareness, and ineffective distribution/servicing are big challenges for the solar lighting market.

Source:

Lighting Africa, Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market, Nairobi, Kenya, 2010.

Consumer education

Consumer education campaign

Lighting Africa's consumer education campaigns help people make informed buying decisions. These campaigns, which have been piloted in Kenya and Ghana, work to generate consumer awareness and mitigate market spoilage. Through provincial road shows, social and trade group forums, door-to-door consumer engagements, and retailer recruitment drives, Lighting Africa showcases products and provides consumer outreach on modern off-grid lighting products. To date, 78 road shows and 470 forums have been held in Kenya and 25 road shows and 50 forums in Ghana. About 11 million people in Kenya and 676,000 in Ghana have been reached through the campaigns, which focus on the rural poor. As a result, sales and stakeholder interest have increased significantly in a relatively short time.

Based on experience in their provinces, Kenya and Ghana launched national consumer education campaigns, including community radio (radio jingles, announcements, and interviews), national television, and press advertisements to target NGOs, bulk buyers, and other stakeholders.

Consumer education materials

Lighting Africa is standardizing consumer education materials, including documentation of best practices and lessons learned for campaigns in other countries.



A poster from Lighting Africa consumer education campaign in rural Ghana. © Lighting Africa.



Lighting Africa organized forums in rural areas to inform consumers about the benefits of solar lighting and what constitutes a quality product. © Lighting Africa.

Policy and public sector operations

Rural electrification integration

Lighting Africa has supported rural energy/electrification agencies and other government agencies in Ethiopia, Mali, Senegal, and Tanzania to create an enabling environment for off-grid lighting. Memoranda of Understanding were signed with Ethiopia, Mali, and Senegal and workshops were held to introduce the program, demonstrate approved products, facilitate networking between manufacturers and distributors, discuss related government programs, and explore financing options. As a result, all four countries are integrating off-grid lighting into rural and informal settlement electrification activities.

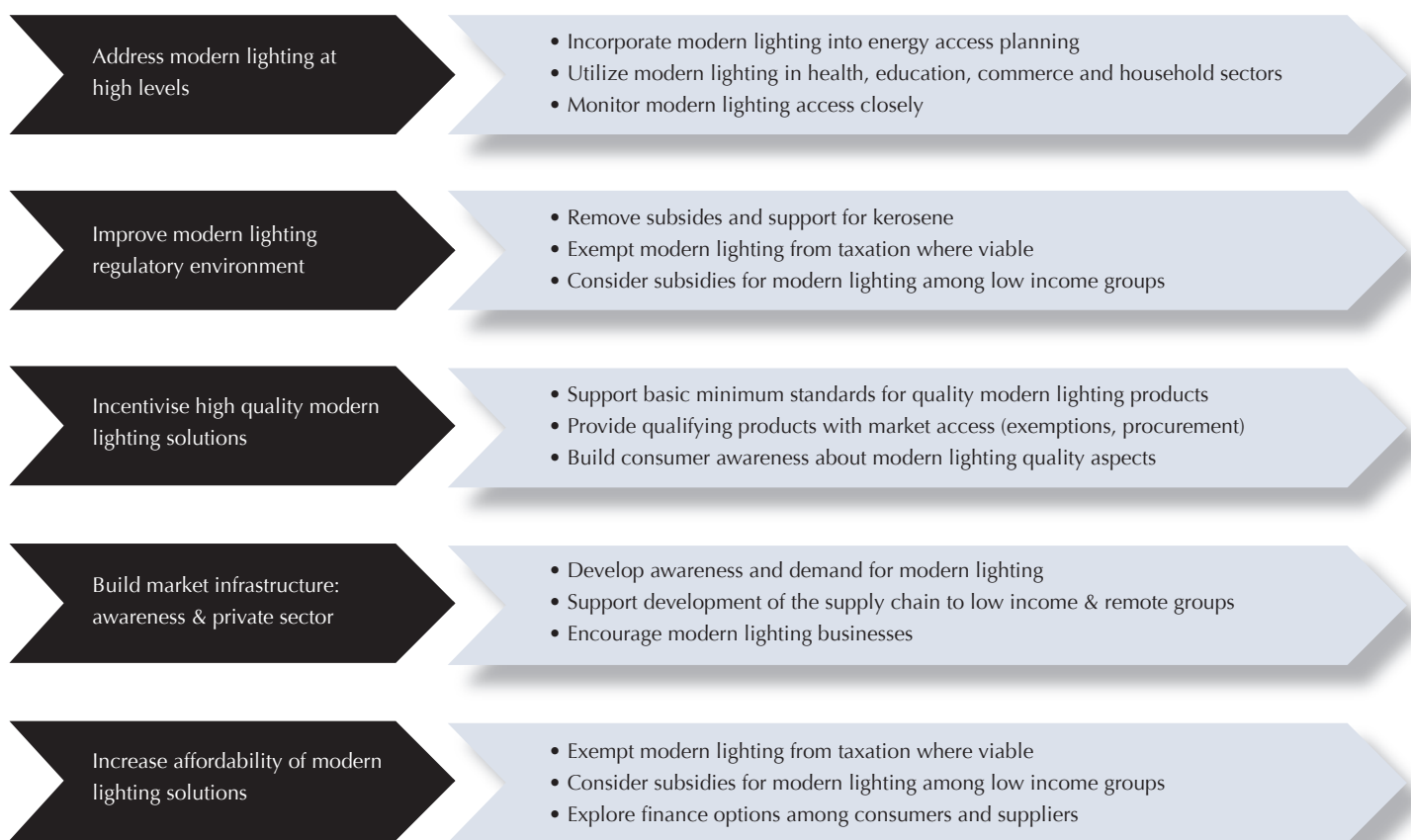
Liberia and Nigeria have also been identified as countries of interest for Lighting Africa support. Activities include providing information on quality assurance activities; making market research and intelligence available; relaying information about products that have passed quality assurance tests; helping identify manufacturers and local distributors; improving the policy environment for off-grid lighting; integrating off-grid lighting in rural concessions; assisting in the design of consumer outreach campaigns; and providing technical and financial support to local distributors.

By coordinating with ongoing local electrification efforts, Lighting Africa complements and adds value to energy access initiatives.

Policy studies

Lighting Africa conducted policy studies in eight countries (Cameroon, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Rwanda, Senegal, and Tanzania) to address barriers to market growth for modern lighting, and create favorable policy and regulatory environments for industry. A synthesis report has been developed, as well as individual country notes. Figure 2 provides the policy intervention matrix summary resulting from the study.

Figure 2: Policy intervention matrix summary



other countries and regions.

Workshops and events for policymakers and business networking

In the last year, Lighting Africa has hosted or participated in a variety of workshops, trade fairs, expositions, and other events to increase awareness of modern lighting opportunities in Africa, show governments the benefits of off-grid lighting and related policy interventions, expand collaboration with donors and other prospective partners, and foster business-to-government and business-to-business networking. For the policy study discussed above, workshops were organized with governments, the private sector, NGOs, and others to identify policy barriers and recommend solutions. In Ethiopia, Mali, and Senegal, workshops were held to set out requirements for rolling out major Lighting Africa programs and showcase qualified products. In Senegal, Lighting Africa participated in the fourth International Fair on Renewable Energies and Environment. The 30 participating companies decided to create a local association for centralizing product orders, which will also reduce their purchase price. In addition, planning is under way for the third International Off-Grid Lighting Conference and Trade Fair, planned for late 2012 in Dakar, Senegal.

Duty removal and incentives

The government of Ethiopia recently waived duties on all off-grid lighting products that meet or exceed Lighting Africa's recommended performance targets, allowing these products to enter the country duty-free. The government is also planning to provide foreign currency loans to encourage the import of approved products.

Knowledge tools

Lighting Africa advises governments on sustainable service delivery models and supports development of tools and toolkits that will allow the program's market transformation approach to be replicated in



Itotia Njagi (left) from Lighting Africa, demonstrates products at a recent Lighting Africa event.

Fostering competition and innovation

Lighting Africa supported the Tanzania Rural Electrification Agency in its Lighting Rural Tanzania Competition, which awarded about \$1 million to 10 companies for innovations in delivery of modern lighting services to rural areas.

The competition results include increased product sales for improved lighting products, a decline in transaction and product costs, and strengthening of supply chains. These activities have helped to build the labor force and improve confidence in these products and services. The government of Tanzania is considering a follow-on competition to incorporate improved lighting for schools and health clinics.

Lighting Africa visits a solar promotion project in Bagamoyo District, Tanzania

One of the competition projects, by Appropriate Rural Technology Institute, uses a local credit system called *mali kauli* (honor of repayment), which enables distributors to get solar products on credit and in turn provide credit to customers. The Institute's consumer education campaigns use lively village-to-village entertainment shows with demonstrations and solar product sales. The Institute is working closely with another competition participant, Kiwia & Lausten, to reduce costs through combined shipping and freight orders.

3. Program Expansion

Lighting Africa aims to be a pan-African program. Lessons learned from the two pilot countries – Kenya and Ghana – are applicable to any country on the continent. Lighting Africa is working with the governments of Ethiopia, Mali, Senegal, and Tanzania to tailor the program to their specific needs. The scale-up has been on a country-by-country approach based on funding availability, but this does not allow for the rapid and extensive scale-up that is needed.

To achieve the greatest impact, the program should be rolled out across Africa in a short period of time. A continent-wide program can take advantage of regional distribution channels and policy agreements, focusing resources where they are needed most. In fiscal year 2011, Lighting Africa initiated design of a regional model to support this expansion.

Given the size and scope of off-grid lighting needs in Africa, and limited funding in this area, a more streamlined, “packaged” program will be undertaken that can be scaled up without much involvement from the Lighting Africa team. The program has identified four objectives for expansion:

- Be more selective about countries in which Lighting Africa operates.
- Focus on results and impact, maximizing the number of people with access.

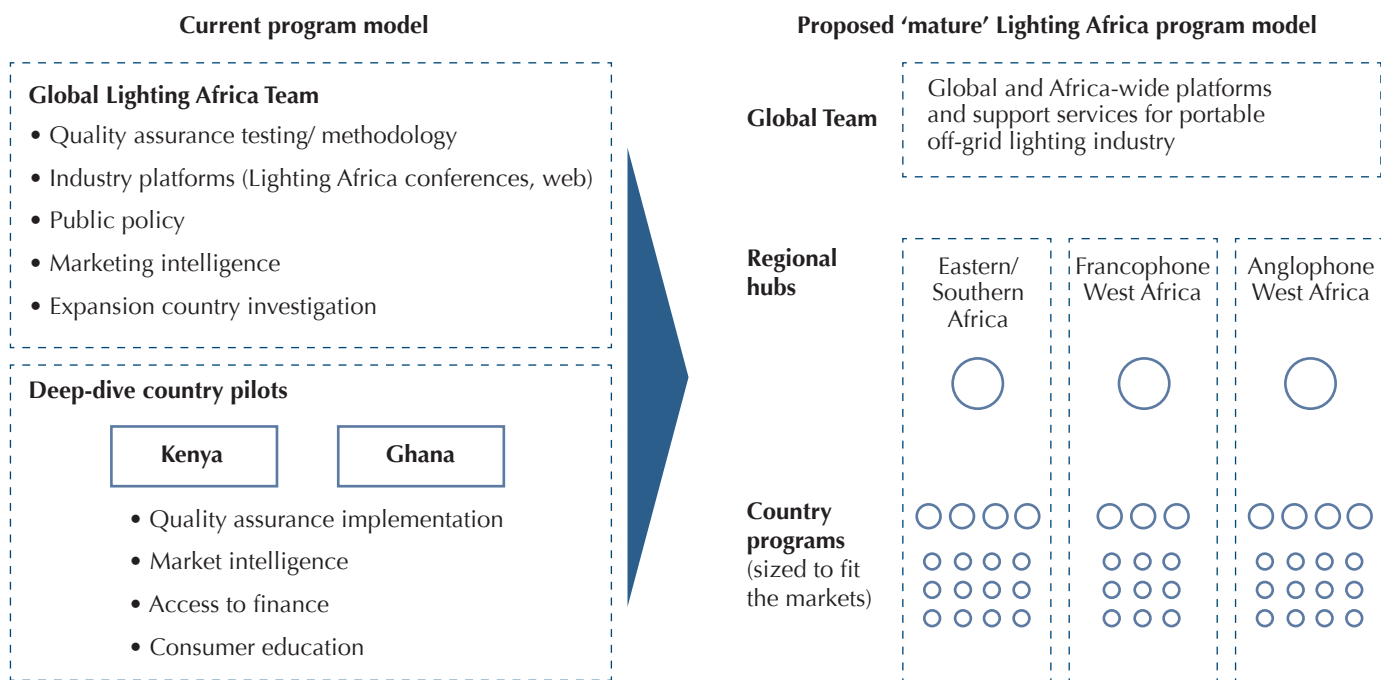
- Adjust the program to fit the size and context of selected countries.
- Reduce program operational overhead.

Expansion plans and priorities will also be coordinated with those of the private sector, primarily manufacturers.

The Lighting Africa expansion program will have a leaner global team, which will focus on Africa-wide networking platforms, standards, services, and sustainability mechanisms to rapidly grow the off-grid lighting market; decentralized regional hubs (about three or four) that provide regional or global product offerings to support country activities (for example, financing access, quality assurance testing, policy standards); and country programs that are tailored to local market requirements and conditions. Figure 3 shows the planned transition to a regional program. Figure 4 shows the regional model and the potential number of people who could be reached in each area. Lighting Africa is mobilizing funds for this expansion.

Lighting Africa can partner with other donors to provide a cost-effective approach for the sustainable provision of basic energy services to a large number of African households and businesses. The organization has the potential to improve the quality of life of 250 million people over the next 20 years.

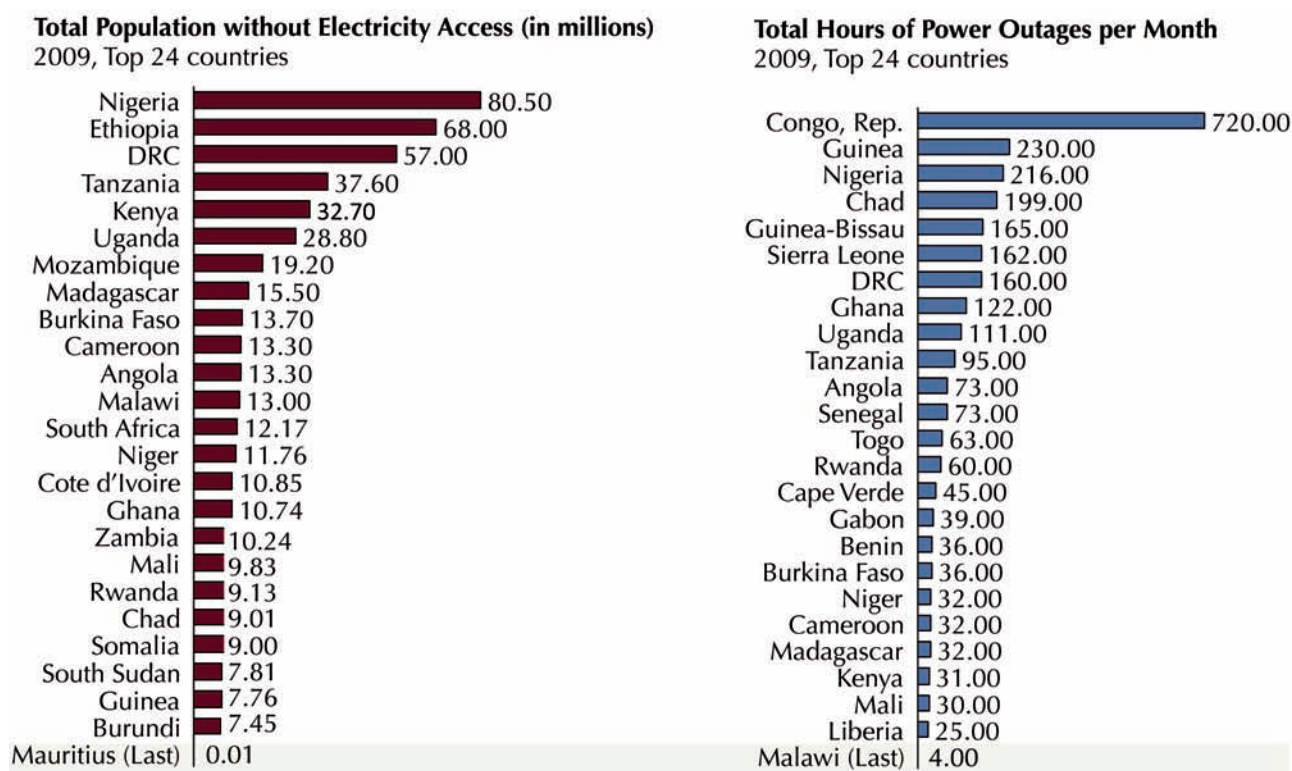
Figure 3: Transition to a regional program



Proposed features of new program delivery approach in line with stakeholder feedback:

- Leaner global team with decentralization of decisionmaking to 3 - 4 hubs
- More standardised processes, products and services with tiered resource allocation by country potential/type
- Focus of global team on cross-cutting networking platforms, standards and sustainability mechanisms
- Roll-out of regional or global product offerings (e.g., access to finance, quality assurance testing processes, policy standards) where possible.

Figure 4: Market potential for modern off-grid lighting products



Source: Dalberg Proprietary Database

Source: World Bank Enterprise Survey

4. Performance

The World Bank and IFC commissioned a mid-term evaluation of the design and delivery of the Lighting Africa program, including its Africa-wide activities and Kenya and Ghana pilots. The evaluation also provided cross-cutting recommendations and identified lessons learned. Key findings and recommendations are provided below.

Lighting Africa is a highly relevant and innovative program that has already contributed to the development and growth of the market

Lighting Africa has accelerated the growth and uptake of private off-grid solutions for low-income households. In a relatively short time, the program has helped increase access to lower cost renewable alternatives to fossil-fuel-based lighting technologies. It is estimated that by mid-2012, the market will surpass Lighting Africa's target of 2.5 million Africans with access to quality, portable, off-grid lighting, up from a base of nearly zero when the program was launched. The program plays a vital convening and networking role for the fledgling off-grid lighting industry; develops and disseminates valuable primary research; establishes the standards, methodologies, and testing infrastructure for improved product quality; and facilitates the entry and growth of off-grid market participants, including multinational corporations. Lighting Africa has been recognized as an innovative example of base-of-pyramid market transformation and best practice for IFC-World Bank collaboration.

Market selection criteria for country pilots should be well documented, emphasizing the need for intervention, rather than overlaying existing IFC/World Bank footprint

Programs selecting pilot geographies should transparently apply any pilot selection framework, and ensure clarity and emphasis on the need for intervention (market size, consumer demand, availability of appropriate private sector counterparts). Relative resource allocation should account for differing needs across countries to ensure more comparable cost-effectiveness for beneficiaries.

Interventions that address critical barriers and require on-the-ground engagement need dedicated local specialist resources, in addition to global expert support

Critical program components need a dedicated local expert, devoting 100 percent capacity to the intervention. For example, the access to finance program has struggled due to a lack of committed in-country expertise.

Complementary relationships between various components and careful assessment of time required for intervention planning should drive program sequencing

Although the component sequencing approach was appropriate (starting with quality assurance, market intelligence, and business development services), the program underestimated the time needed to launch other components, such as access to financing and consumer education. Component design should be informed by the inputs required, including sufficient time for launch preparation and linking with other components.

Government engagement is critical to ensure progress

Lighting Africa's success in Kenya was facilitated by strong government support. Although the private sector is the immediate beneficiary of market transformation programs, securing buy-in from the public sector can reduce the risk of governments setting adverse expectations and incentives.

Quality standards should be a critical component of market transformation

Quality standards are a vital public good. Organizations like the World Bank Group are well placed to contribute in this area by supporting the development of technical standards and their adoption by the private, public, and development sectors. Investment in standards is substantial. Adequate planning should be in place for consultation, testing timelines, and recruiting supporters to implement quality standards at scale.

Cost-effectiveness is enhanced through scalable activities with market-wide effects, rather than individual advisory support

Although Lighting Africa's support to individual market players has been effective, it is not the best use of resources as support is highly customized. Scalable solutions, such as cross-cutting networking platforms, are more appropriate given limited resources and ambitious targets. Outsourcing support to organizations through technical assistance grants is more efficient.

The social sector's reach in low-income groups should be maximized

NGOs have a strong track record in working with low-income groups, and can be a cost-effective means for reaching this segment, particularly for non-grant activities such as awareness campaigns.

Cross-cutting platforms, such as industry-wide forums and websites, are powerful tools for market mobilization

If held at the right time, with participants across stakeholder groups, conferences can jumpstart markets, establish networks, and gather market/competitor intelligence. However, they are costly and should be used sparingly, with plans for scaling up private sector contributions and transferring ownership to industry. Websites, including relationship referral, virtual markets, and knowledge hubs can also help to create industry value and cement Lighting Africa's convener role.

Monitoring and evaluation of market transformation programs requires new indicators, greater investment into baselines, and active collection of stakeholder feedback

A comprehensive evaluation of program impact requires investments in baselines for key program indicators, the overall market, and beneficiary groups.

Based on this review, Lighting Africa is revising program design activities, including implementation plans for country expansion.

5. The Way Forward

Component-specific recommendations provided in the mid-term review are summarized in the table below, with planned responses from Lighting Africa for FY12 and beyond. In several cases, activities have already started.

Table 2: Planned activities

Component	Finding/Recommendation	Planned activities for FY12+
Market intelligence	Relative importance of market intelligence should decline. Focus should be on practical market research in expansion countries.	<ul style="list-style-type: none"> • Integrate market intelligence into scale-up plans.
Quality assurance	Review performance requirements/standards to ensure they do not inadvertently stifle innovation.	<ul style="list-style-type: none"> • Support development of testing capacity at University of Nairobi and Center for Study and Research on Renewable Energies in Dakar. • Continue maintenance of quality standards and performance targets while remaining sensitive to changes and needs from the market and industry. • Work with governments on standards development and harmonization. • Develop quality seal. • Provide technical advisory services. • Implement outstanding product awards selection process. • Conduct field research on market presence and performance of products. • Develop technical note on CDM and its links to the quality testing methodology.
Business support services	<p>Matching services are important but expensive. Cannot sustain this model as sophistication and number of players increase.</p> <p>Cost sharing of services is vital to ensure relevance and effectiveness.</p> <p>Develop grant facility to meet distributors' local needs and standardize approach.</p>	<ul style="list-style-type: none"> • Implement multi-tiered business support system, including matching grants and cost shares. • Focus on scalable services, including standardized services and tools. • Reduce individual support to improve scale-up and outsource service delivery. • Engage local agents/ distributors for matchmaking. • Plan for third International Off-Grid Lighting Conference and Trade Fair. • Continue to expand web portal and facilitate member networking/exchanges.
Component	Finding/Recommendation	Planned activities for FY12+
Access to finance	<p>Access to finance has had limited resource support.</p> <p>Activities were deferred in favor of other components.</p> <p>Priority area for manufacturers, distributors, consumers.</p>	<ul style="list-style-type: none"> • Hire dedicated finance specialist; shift more resources to this component. • Identify finance institutions and specialized funds to become partners; document their terms/conditions. • Leverage IFC financing programs, specialized funds, microfinance institutions, and other finance institutions to reduce finance gap. • Develop partnerships with bulk buyers (governments, firms). Assist associates and others in securing CDM and other carbon financing.

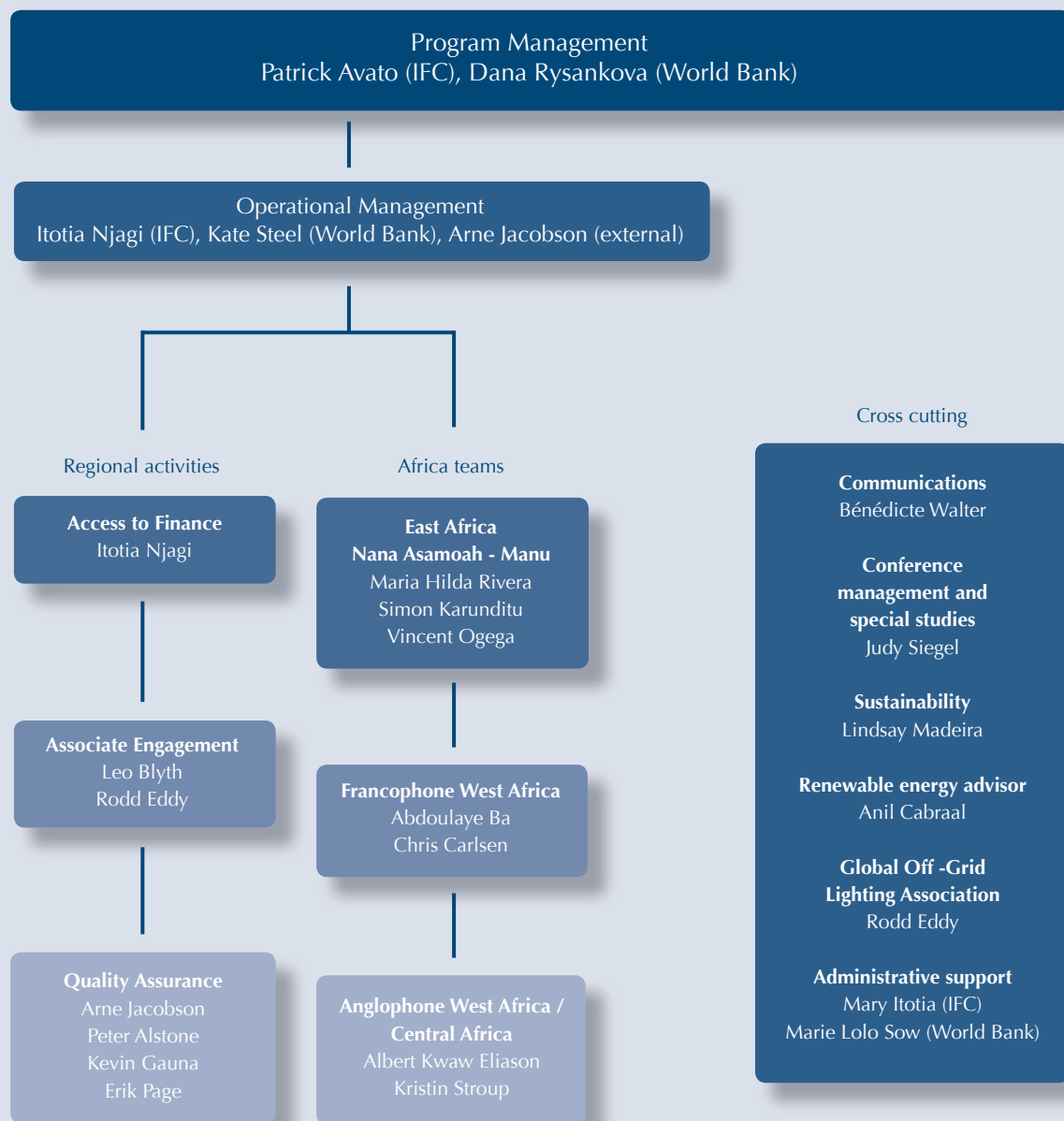
Consumer education	<p>Positive impacts on consumer awareness/access to quality products, particularly in Kenya. Enhance strategy communication, better results measurement, leverage NGO/social sector, and target retailers.</p> <p>Rethink below-the-line consumer education; increase above-the-line national roll-outs.</p> <p>Better communicate market segmentation/targeting plans.</p>	<ul style="list-style-type: none"> • Increase funding for consumer education. • Help distributors with access to financing. • Train distributor staff. • Target more urban off-grid areas. • Intensify microfinance institutions and outlet outreach for rural areas. • Implement more robust monitoring and evaluation mechanism. • Develop extensive communication strategy. • Increase direct sales generation activities. • Develop toolkits and replicate campaigns in expansion countries.
Policy and public service operations	Engage governments from the beginning.	<ul style="list-style-type: none"> • Work with governments to mitigate barriers in eight countries studied. • Include Lighting Africa component in rural energy agency, World Bank, and donor rural electrification projects. • Obtain government commitment in expansion countries.
Program expansion	<p>As the program matures, realign relative component priorities.</p> <p>Increase focus and budgets on access to finance and consumer awareness components.</p>	<ul style="list-style-type: none"> • Implement program expansion across Africa. • Set up regional hubs. • Increase budgets for finance/consumer education; reduce budgets for market intelligence and policy; keep quality assurance constant.
Monitoring and evaluation	Enhance monitoring and evaluation indicators to better reflect program impacts.	<ul style="list-style-type: none"> • Establish project baselines. • Update monitoring and evaluation plan to benefit program.
Global Off-Grid Lighting Association	<p>Establish Lighting Africa exit strategy and timeframe for Global Off-Grid Lighting Association takeover.</p> <p>Secure association's financial resources and support over next few years.</p> <p>Provide leadership/direction through mid-term transition.</p>	<ul style="list-style-type: none"> • Finalize NGO incorporation, working groups, functionality. • Secure funding. • Hire executive director and staff. • Implement business plan. • Work on a clear exit strategy and timeframe; begin hand-off of Lighting Africa activities to association.

6. Program Implementation

Management team

In FY11, the management structure for Lighting Africa evolved to reflect the expansion to a continent-wide program. Figure 4 provides the overall management structure.

Figure 5: Organizational chart



Budget

Lighting Africa's FY11 budget is provided in the table below. It includes an expenditure summary by key activities, as well as the sources of funds. In total, about \$3.1 million was spent in FY11.

Table 3: Lighting Africa budget FY11 (US\$)

Activity	Disbursements (IFC) US\$	Disbursements (World Bank) US\$	Disbursements Totals US\$
Market Intelligence	156 000		156 000
Consumer education	447 000		447 000
Product quality assurance	234 000	312 057	546 057
Access to finance	46 000		46 000
Business support services (World Bank) / business development (IFC)	232 000	33 454	265 454
Policy and public sector operations		345 531	345 531
Outreach and conference support		88 533	88 533
Program management	724 000	88 132	812 132
Program expansion		434 283	434 283
Other	20 000	484.00	20 484
Total Disbursements	1 859 000	1 302 474	3 161 474
Donor	Funding sources (IFC)	Funding sources (World Bank)	Funding sources Totals
Africa Renewable Energy and Access Grants Program		1 070 000	1 070 000
Public-Private Infrastructure Advisory Facility		232 474	232 474
IFC Sustainable Business Innovator Multi-Donor Trust Fund (including Luxembourg contribution)	187 868		187 868
Global Environment Facility for IFC LBOP (Lighting the Base of the Pyramid) Project	1 461 028		1 461 028
Norway	210 104		210 104
Total Funding	1 859 000	1 302 474	3 161 474

Products that pass Lighting Africa's minimum quality standards, meet the recommended performance targets and are currently available in Africa. PUBLIC LIST as of 2 March 2012.

Appendix I

Company name	Product name	Passes quality standards?	Meets performance targets?
Barefoot Power Ltd.	Firefly 12 Mobile	Yes	Yes
Barefoot Power Ltd.	Powapack 5 W	Yes	Yes
Barefoot Power Ltd.	PowaPack Jr. 2.5 W Matrix	Yes	Yes
d.light	S250	Yes	Yes
Foce - Globest	Solar Ambient Light	Yes	Yes
Greenlight Planet	Sun King™	Yes	Yes
Greenlight Planet	Sun King™ Pro	Yes	Yes
NEST	Aishwarya CFL Version	Yes	No
Nuru	Nuru Light + POWERCycle	Yes	Yes
Philips	Uday Mini	Yes	Yes
Philips	Solar Home Lighting System	Yes	Yes
Prakruthi Power	Arundhati Home Light	Yes	Yes
Uniglobe	Uniglobe SolarMine 100	Yes	Yes
Solux Service GmbH	LED-50	Yes	Yes
Sunlite	Sunlite Solar Light G3	Yes	Yes
SunNight Solar	SN-2	Yes	Yes
SunNight Solar	Mini-BoGo	Yes	No
SunSum Solar, Inc.	SunSumLite	Yes	Yes
SunTransfer	SunTransfer2	Yes	Yes
Tough Stuff	Room Light "Kit"	Yes	Yes
Tough Stuff	Desk Lamp "Kit"	Yes	Yes
Trony Solar Holdings Co.Ltd.	TSL-01	Yes	Yes



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