LIGHTING AFRICA
Catalyzing Markets for Modern Lighting

AN INNOVATION OF IFC International Finance Corporation World Bank Group
THE WORLD BANK

ESCO business models in promoting energy access

Leo Blyth, consultant for IFC, Lighting Africa

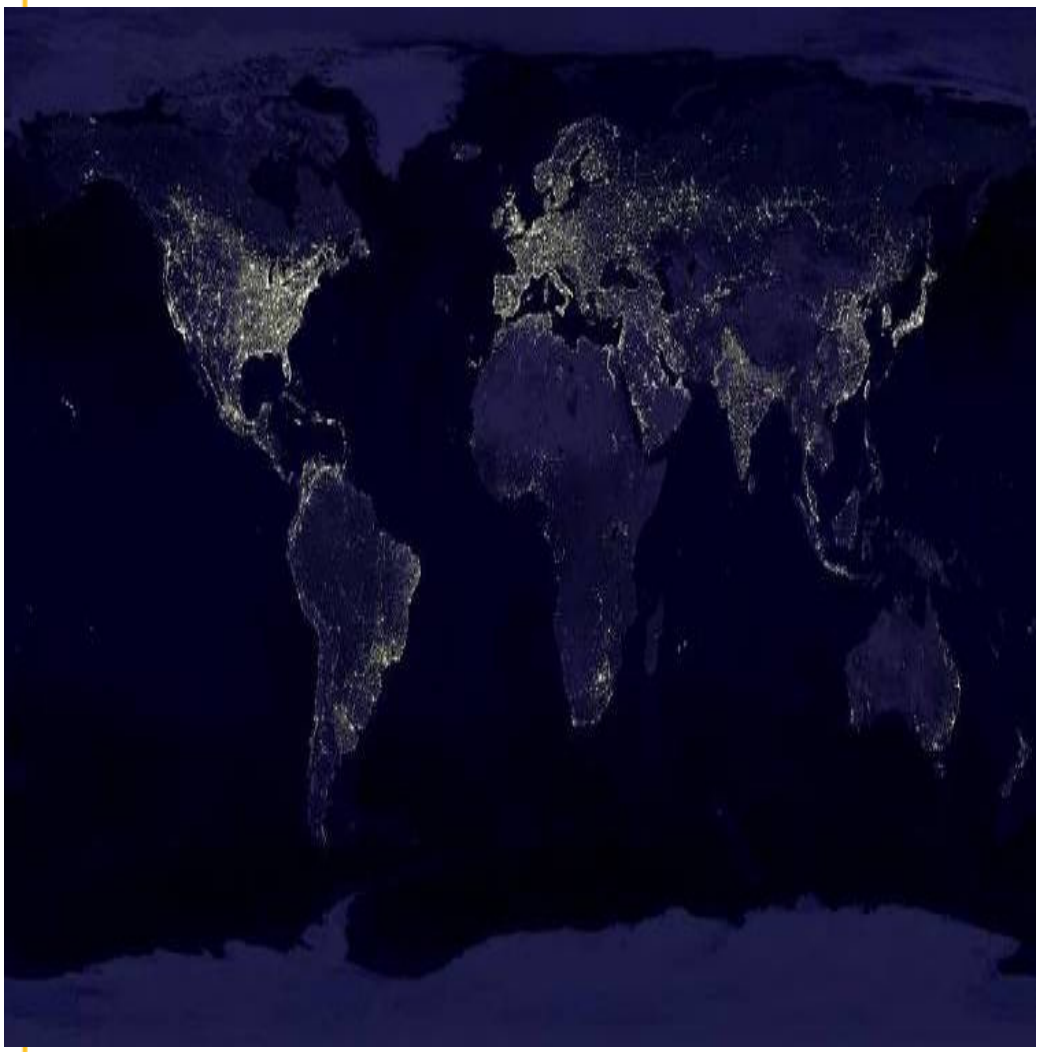
Dakar, Senegal

8th Nov 2013



www.lightingafrica.org

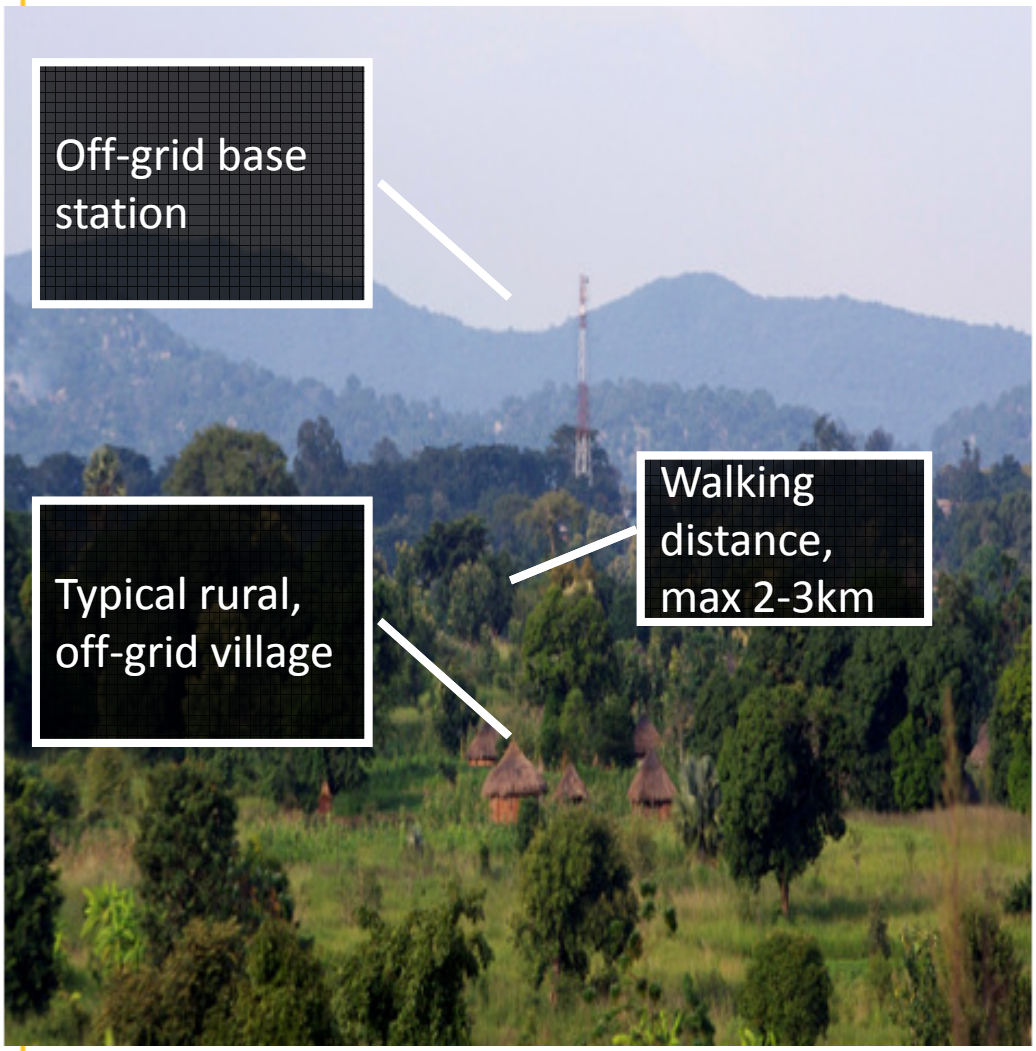
1.6 billion people off-grid, creating barriers for economic development & mobile industry growth



- REAL MARKET FOR POWER…
- 500 million off-grid subscribers pay one third of their monthly mobile spend at charging shops, average US$3[2]
- Significant ARPU lost due to off-grid users unable to power sufficient talk-time
- Barrier to economic growth *'None of the Millennium Development Goals (MDGs) can be met without major improvement in energy access'*[1]

1 – United Nations
2 – GSMA

Scale is possible due to the amount of power infrastructure already deployed



- Two to three kilometres distance between rural base stations is typical, within walking distance
- 5kW of excess power is enough to charge 5000 handsets, provide electricity to 40 homes, power 10 vaccination fridges or 2 clinics[1]
- Therefore, a large scale, distributed power grid in the developing world exists and can be utilised
- Developing world communities spend US$433 billion on off-grid energy[2]

1 – GSMA estimates
2 - World Resources Institute

GSMA/IFC Partnership

- Publicly launched on 17th November 2010 at the Mobile Asia Congress in Hong Kong
- Demonstrating scalable, revenue driven business models for charging services from excess power at off-grid towers
- Initial scope will focus on charging a of devices such as mobile handsets, lanterns and household batteries, but longer time looking to power, businesses, clinics, vaccination refrigerators, schools and homes

What is Lighting Africa?



- A "**Market Transformation**" effort that supports and builds institutions that make an energy market work for rural people.
- A **World Bank / IFC** program
- Relatively well funded (10's of Millions USD)
- Pilot in **Kenya and Ghana** with six key elements from 2008-present
- **Expanding** in 2012 to multiple countries in Sub-Saharan Africa and partially replicated in India

Lighting Africa, Lighting India, Lighting Global

- Originally launched as Lighting Africa, a joint IFC-World Bank initiative
- Now involves collaboration between IFC, World Bank, and U.S. DOE
- Lighting India activities began in 2011; official launch in May, 2012

LIGHTING AFRICA
Catalyzing Markets for Modern Lighting
AN INNOVATION OF IFC International Finance Corporation World Bank Group
THE WORLD BANK

Lighting Africa Program:

- Quality Assurance
- Consumer Awareness
- Access to Finance
- Market Intelligence
- Policy and Regulatory Reform

LIGHTING ASIA
Catalyzing Markets for Off-Grid Lighting
AN INNOVATION OF IFC International Finance Corporation World Bank Group

U.S. DEPARTMENT OF ENERGY

LIGHTING AFRICA
AN INNOVATION OF IFC International Finance Corporation

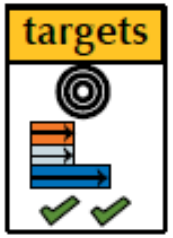
Lighting Global Quality Assurance

Working with the **International Electrotechnical Commission** (IEC) to institutionalize a global quality framework for small off-grid lighting systems. Technical specification IEC 62257-9-5: Selection of stand-alone lighting kits for rural electrification



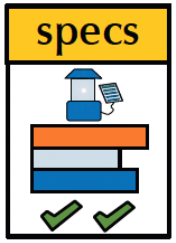
Minimum Quality and Durability Standards

Metrics and thresholds for ensuring truth in advertising and minimum product quality



Program Specific Performance Targets

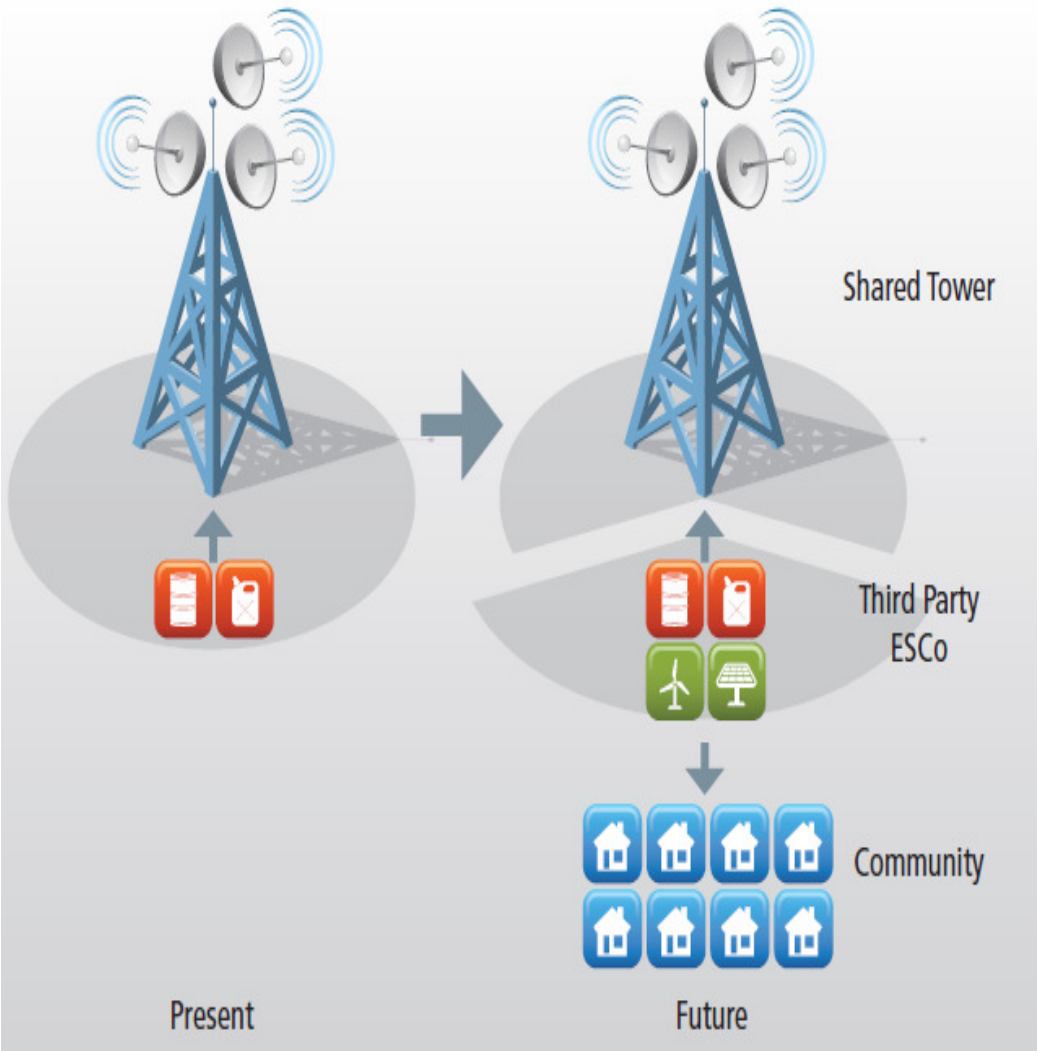
Program-specific performance levels that go beyond minimum standards; used to determine access to specific program services



Standardized Specification Sheets

Standardized framework for reporting verified performance for products that meet minimum quality standards; available at www.lightingafrica.org/specs

ESCO's for BTS power & beyond…



- Adaptation of the OPEX model for solar powered BTS in India
- Operator or tower company sells their diesel generators to a 3rd party Distributed Utility Company
- The 3rd party constructs a mini-grid to the BTS and the community and sells power at reduced cost due to economy of scale
- Diesel generator could remain within the BTS site for a rental fee
- Operator/tower company receives cheaper energy, earns rent, releases capital from genset sales, outsources non-core business and enables community to be powered

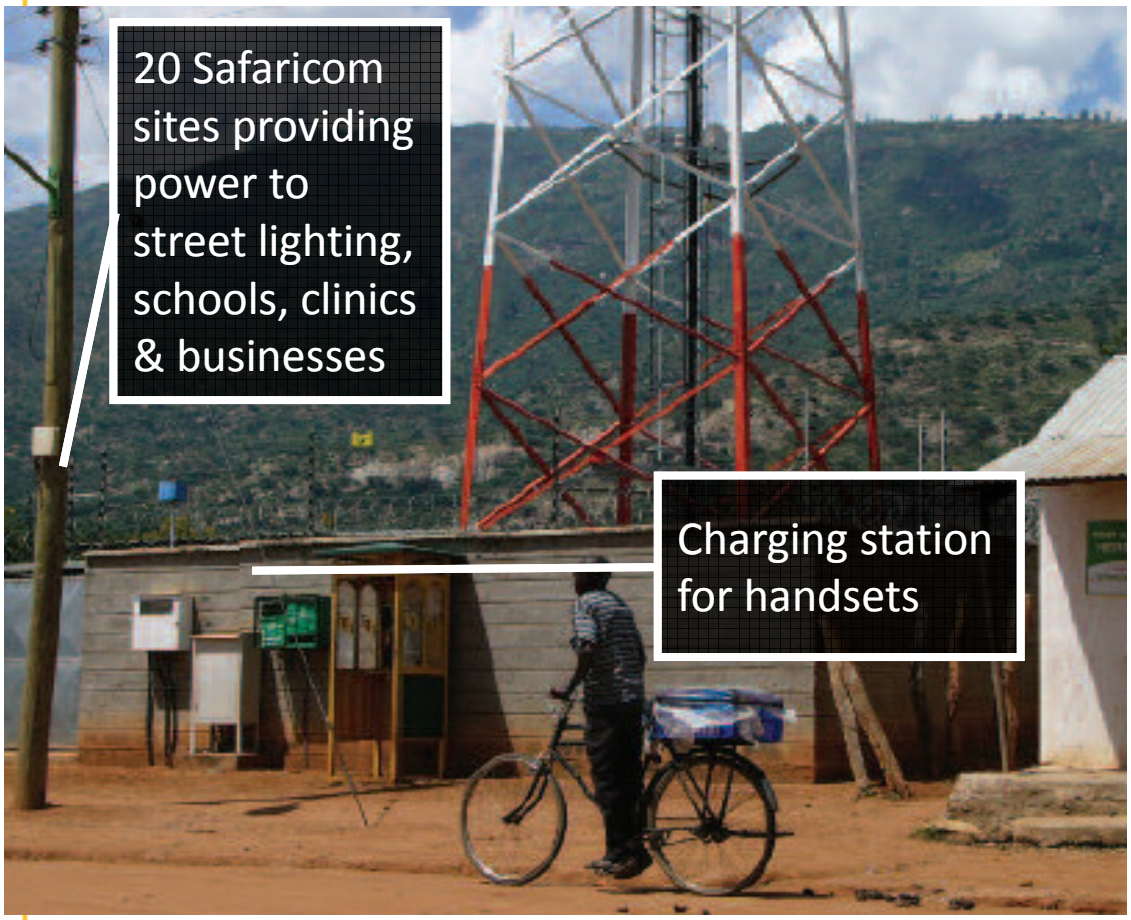
Alternatives for base station & end-user power

Consumer owned solutions	Enterprise operated consumer solutions	Integrated MNO operations & consumer solutions
• Stand-alone Solar Home System (SHS) power • Battery Based Systems (BBS) • Stand-alone “Pico PV”	• Grid powered charging operations • Off-Grid – Generator or PV powered charging operations	• End-user stand-alone handset charging branded (sold / sponsored) or facilitated • MNO branding of energy products • “Business-in-a-box” MNO branded charging solutions • BTS – tied Enterprise charging solutions



An opportunity exists for operators to provide or sell power to the local community

Safaricom



中国移动通信 CHINA MOBILE

- 1 site in off-grid Sichuan province, provides 10kW of excess power to local village

zain

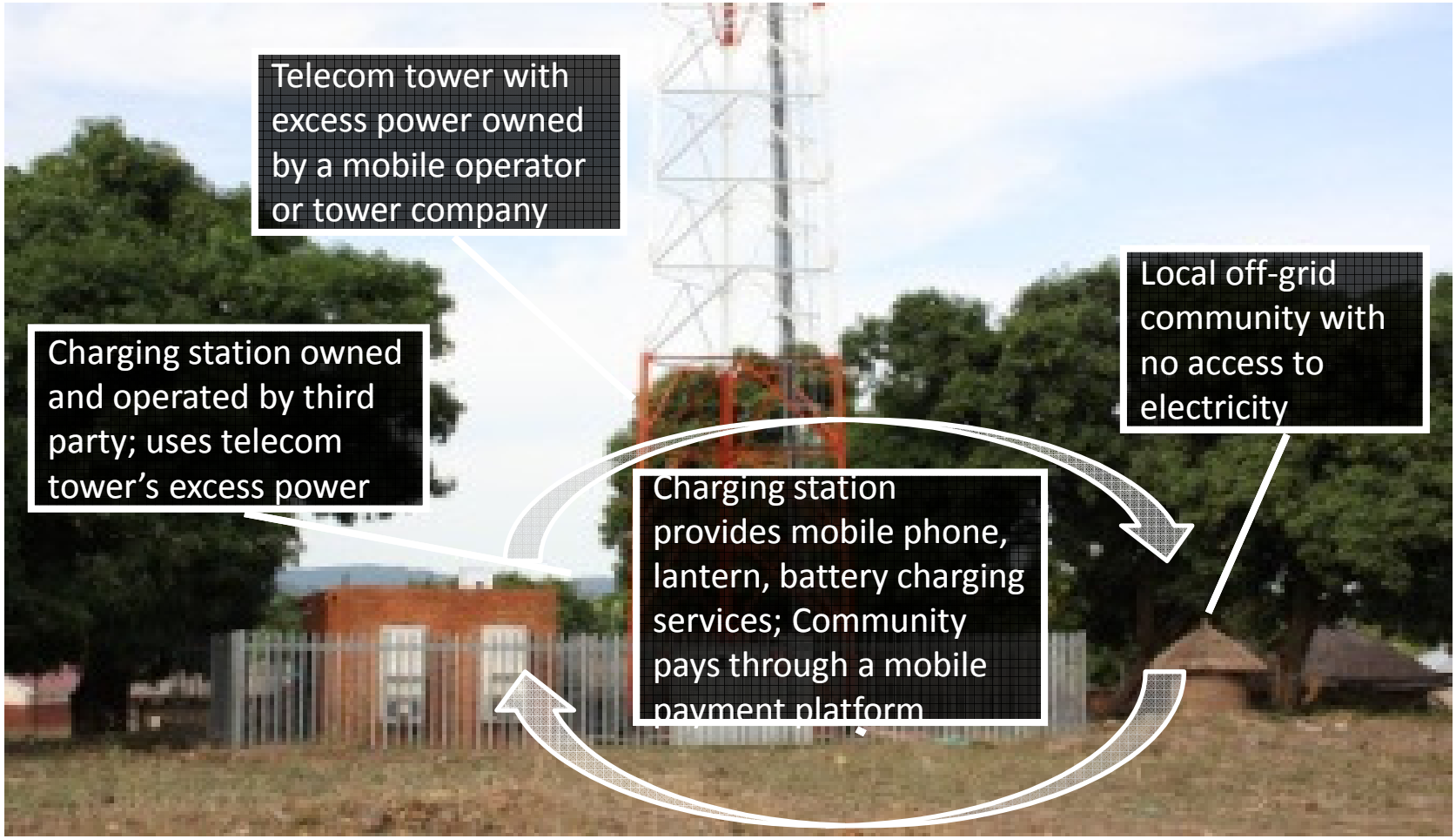
- Site in Dertu, Northern Kenya
- Vaccine fridge powered by excess power from the site

orange™

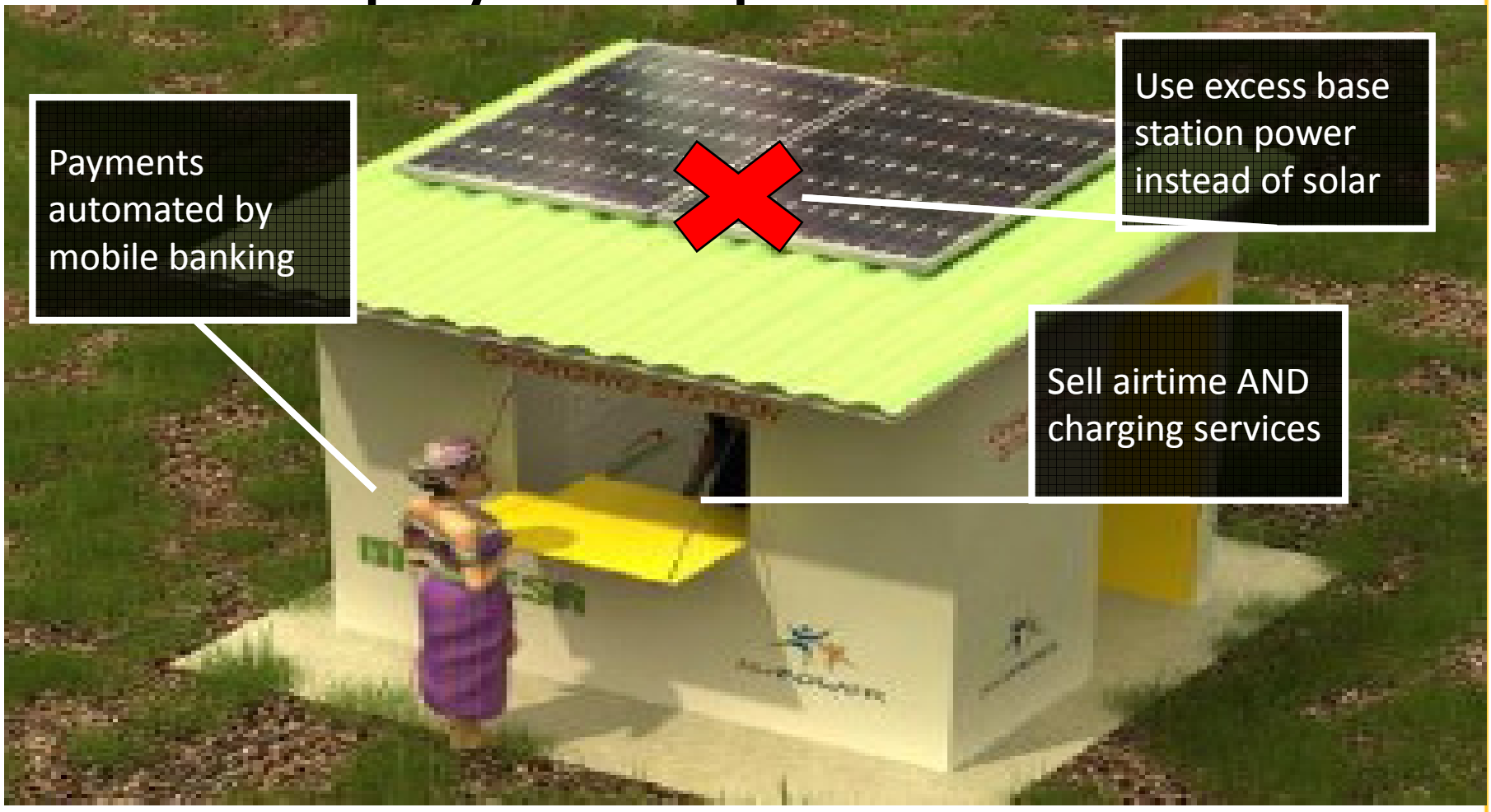
- Site in Niger
- Health clinic powered by excess solar

LIGHTING AFRICA — AN INNOVATION OF IFC International Finance Corporation

Sample CPM Pilot Model



Integration with mobile banking and payment platforms



Selling points of “community power”

- Brand loyalty & protection of Base Stations
- Increased ARPU when mobile users increase talk-time due to constant access to power
- Potential increases in attractivess for ESCO selling power to community beyond BTS anchor client
- Enterprise power is simplest form
- Development impacts

Challenges in “community power”

- Requires a shift in MNO/ESCO focus
- Greatest challenges in grid creation/operation
- Distinctly different skill set needed to create, manage and profit from selling services to nearby community
- Possible negative impacts on MNO from dis-satisfied energy customers

Barriers

- **Awareness & Ecosystem** - Provision of Community Power at base stations is a nascent concept within telecoms and MNOs have limited understanding of the opportunity, the case studies, business models and the required partners.
- **Business Case** - As Community Power is a nascent concept within telecoms the financially viable business models require identification and demonstration. Attractive financial returns must be identified for all stakeholders of the value chain to enable scaling.
- **Expertise & Capacity** - In order to deploy Community Power, MNOs require new skills and expertise, and in many cases, MNOs will require direct support in scoping, planning and executing a Community Power implementation.

Alternatives for base station & end-user power

Consumer owned solutions	Enterprise operated consumer solutions	Integrated MNO operations & consumer solutions
• Stand-alone Solar Home System (SHS) power • Battery Based Systems (BBS) • Stand-alone “Pico PV”	• Grid powered charging operations • Off-Grid – Generator or PV powered charging operations	• End-user stand-alone handset charging branded (sold / sponsored) or facilitated • MNO branding of energy products • “Business-in-a-box” MNO branded charging solutions • BTS – tied Enterprise charging solutions




Questions?
Let’s discuss…

Background on IFC market transformation for off-grid power & lighting for the BOP

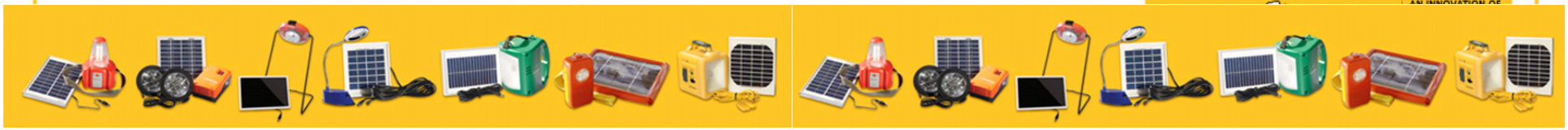
Lighting Africa provides support across the supply chain.



Lighting Africa/Global/India **interprets, communicates and coordinates** between diverse stakeholders, from factories in Shenzhen to rural people who purchase and use the products. The program aims to be a **trusted source for good information**—a market support institution.

Lighting Global QA Program Highlights

2	test methods	• QTM and ISM are actively used
4	active test labs	• Kenya / California / Germany / New York / **Dakar underway**
120+	products tested	• Ever-expanding coverage of the market
50+	products passed quality standards	• Allowed to use Standardized Specifications Sheets; differentiated from other products.
1M+	quality assured products sold in Africa	• Over 1,00,000 quality assured products sold in sub Saharan Africa, reaching an estimated 5-6M off-grid people.
2	institution referencing test method	• UNFCCC harmonized with Lighting Global QTM for carbon finance (CDM) compliance & test standard adopted by IEC
2	product awards competitions	• 2012 awards built on success of 2010
14	technical briefing notes	• Part of the technical assistance to the market



Our international team for off-grid lighting quality assurance has deep experience

Off-Grid Lighting QA Core Team

LIGHTING GLOBAL — Catalyzing Markets for Modern Lighting — AN INNOVATION OF IFC International Finance Corporation World Bank Group — THE WORLD BANK

U.S. DEPARTMENT OF ENERGY

IEC

SCHATZ ENERGY RESEARCH CENTER

NAVIGANT

Fraunhofer ISE

Lighting Global QA Team Expertise

Team Leadership	Rick Duke (DOE), Patrick Avato (IFC), Dana Rysankova (WB)
Technical Team Lead	Arne Jacobson
Energy Systems Experts	Peter Alstone, Kristen Radecsky, Norbert Pfanner, and others
Lighting and LED Experts	Erik Page, Kevin Gauna
QA Strategic Planning	Shannon Graham, Paul Waide
Industry Liaisons	Rodd Eddy, Leo Blyth
End user Liaison	Jenny Tracy
Technical Writers	Marc Marshall, Robert Hosbach

Regional Teams

East Africa Team	Itotia Njagi, Nana Asamoahmanu, …
West Africa Team	Abdoulaye Ba, Chris Carlsen, …
India Team	Hemant Mandal, Anjali Garg, Naomi Bruck, Dr. TC Tripathi …

LIGHTING AFRICA — IFC International Finance Corporation