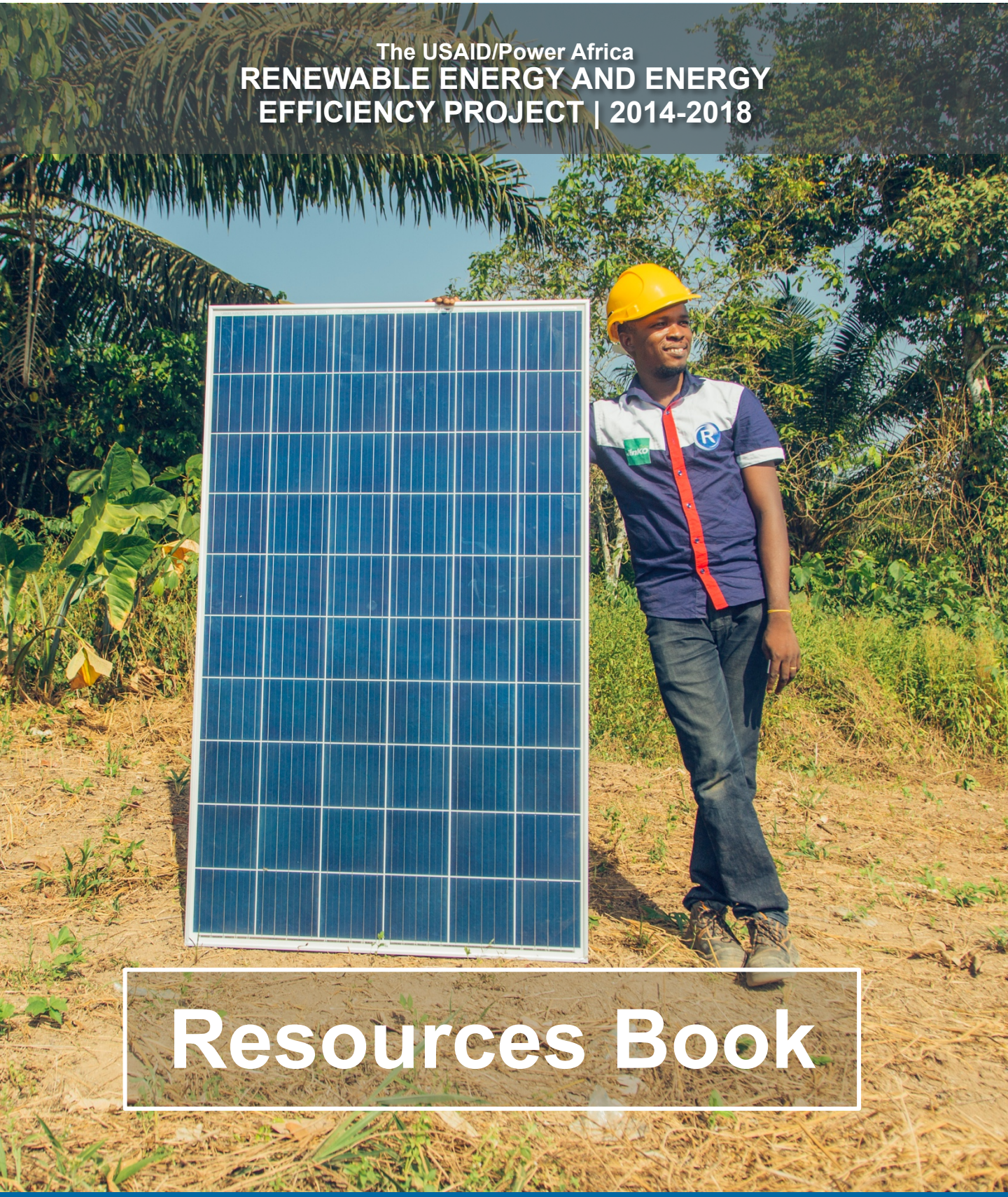
USAID
FROM THE AMERICAN PEOPLE

POWER AFRICA

WINROCK INTERNATIONAL

The USAID/Power Africa
RENEWABLE ENERGY AND ENERGY EFFICIENCY PROJECT | 2014-2018



Resources Book

Recommended Vendors, Pipeline of Projects, Lessons Learned and more information for stakeholders in the renewable energy sector of Nigeria

Table of Contents

This handbook is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Winrock International and do not necessarily reflect the views of USAID or the United States Government.

Dear Partners,

It's been a pleasure and honor to work in the renewable energy and energy efficiency sector in Nigeria. These past four years have been a challenging, yet transformative time. We witnessed a foreign exchange crisis that severely restricted financing for RE/EE projects. Despite this, we saw Nigerian companies making movement on ambitious new projects, such as Africa's largest (potentially) solar irrigated farm. Additionally, in partnership with GIZ NESP, six off-grid mini grids are launching, which will play a pivotal role in demonstrating the bankability of such projects in Nigeria.

The Renewable Energy and Energy Efficiency Project (REEEP) was funded by USAID and Power Africa and implemented by Winrock International. At its core, the project sought to promote the use of renewable sources of energy by offering services to a variety of stakeholders in the sector. We offered services to financial institutions to improve their capacity to serve the RE market and to facilitate financing. We offered services to RE developers to increase their ability to provide quality products. Finally, we offered services to those government institutions that provide the enabling environment necessary for the development of the sector.

While much progress has been made, there is still a lot of work to do to increase the competitiveness and quality of the sector. Although REEEP is finishing at the end of February 2018, we rest assured that our partners will continue the forward momentum we've built together and bring broad benefits to the sector.

We intend this book to provide valuable resources to all stakeholders in the RE/EE sector. Our Recommended Vendor List and Pipeline of Projects will be useful to investors interested in this sector or companies looking to hire RE/EE companies for a project. Nigerian businesses will find information on certification curricula and training centers, as well as contact information for other NGOs working in the sector. Finally, our Lessons Learned section captures the knowledge REEEP gained during the project that we believe can benefit all stakeholders facing similar challenges.

We are certain that REEEP would not have been able to achieve such results without the help of a few key partners. First and foremost, we thank the generosity and support of USAID and Power Africa who allowed REEEP the privilege to contribute to improving energy services for Nigerians. We'd like to thank all of our institutional partners, including NEMSA, REAN, USAID PATRP, Shell Foundation's All On, the World Bank and IFC, CEADIR, Heinrich Boll Foundation, and Power for All. In particular, we'd like to highlight our partnership with GIZ NESP. It was clear from the beginning that NESP and REEEP shared common objectives. By working together we accomplished so much more than we could have alone. So we encourage all stakeholders in this sector to achieve together.

Last but not at all least, we'd like to thank all of the Nigerian businessmen and women who are working in this sector. They are true visionaries who can see the enormous benefits renewable energy can bring to Nigeria, despite the daily challenges standing in their way.

Sincerely,

Javier Betancourt
Chief of Party
Renewable Energy & Energy Efficiency Program

USAID REEEP's Achievements

The Renewable Energy and Energy Efficiency Project, funded by USAID/Power Africa, facilitated the development and financing of renewable energy (RE) and energy efficiency (EE) markets and strengthened the current policy and regulatory environment for public and private sector investment. The project, which ran from March 2014 to February 2018, aimed to mitigate climate change, reduce carbon emissions, increase economic opportunities, improve employment, and, ultimately, sustain development in Nigeria. REEEP implemented the following three components:

Component 1: Increase access to clean energy financing for project developers

This component identified SMEs for capacity building opportunities and increased access to finance for RE/EE projects. To do so, REEEP identified domestic and international sources of funds for the RE/EE sector then worked with the requirements of the market and the infrastructure nature of such projects to facilitate finance to the sector.

On the other hand, REEEP worked with SMEs to maintain a list of recommended vendors and build a pipeline of projects that are seeking financing. To become a recommended vendor REEEP conducted financial due diligence and technically assessed the company's capabilities. See page 3 for REEEP's Recommended Vendors. The pipeline of projects provides investors with a list of bankable projects (see page 21).

Component 2: Provide technical assistance to financial institutions

Due to exchange rate fluctuations, market uncertainty, and a variety of other causes, Nigerian banks are extremely risk averse in their lending practices and are known to require collateral that can be worth 200% or more of the loan. This eliminates commercial credit from the purview of many Nigerian businesses, especially SMEs. Moreover, RE/EE lending is generally seen as presenting additional risk because most financial institutions do not know how to conduct credit-risk analysis for such projects. Many lenders are skeptical that meaningful cash flow can be generated from RE/EE projects or that the cash flow can be relied upon to repay loans.

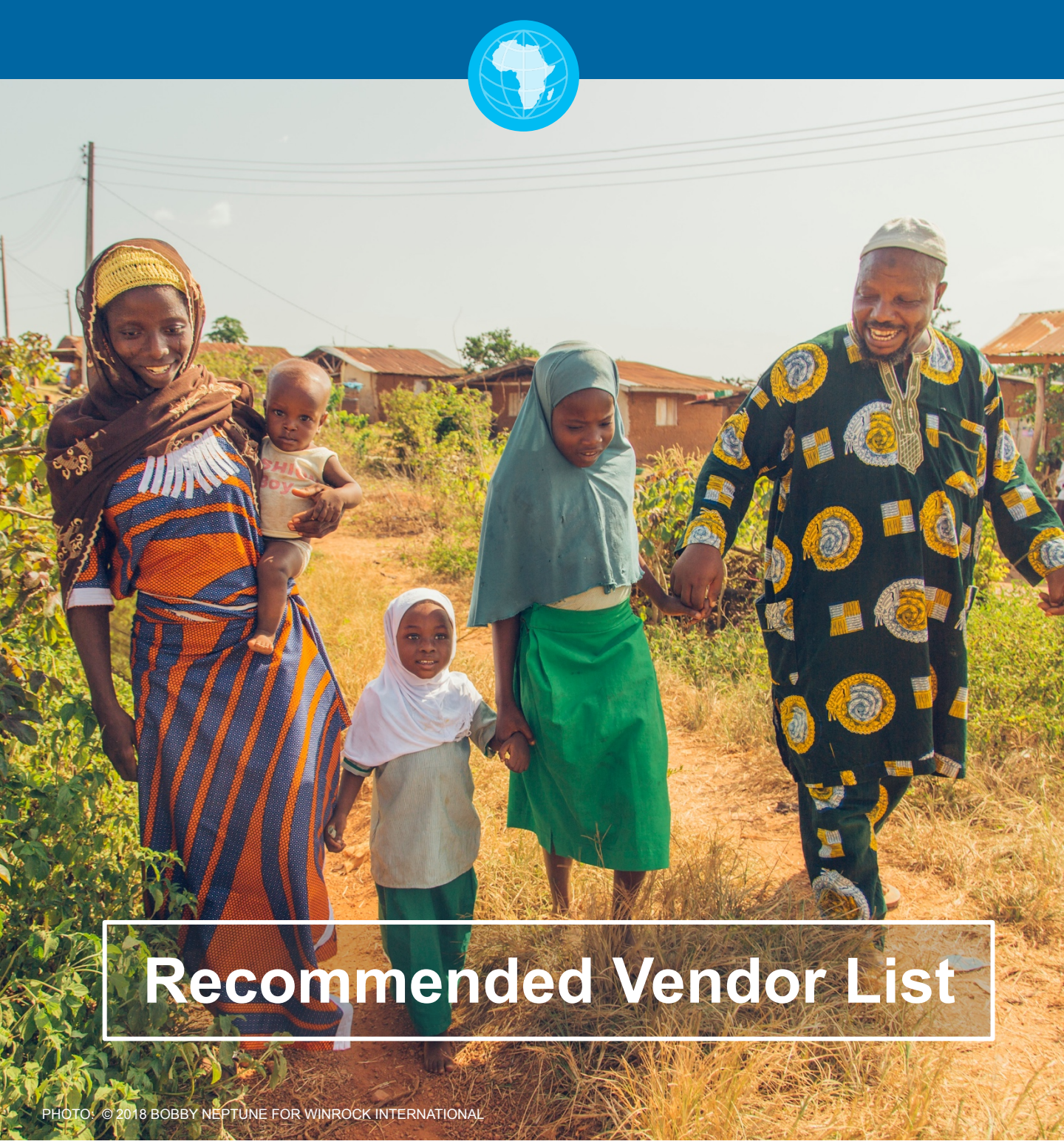
Under this component, REEEP provided technical assistance to financial institutions to encourage lending within terms more favorable to RE/EE project developers and for RE/EE technology. This effort initially focused on supporting Ecobank's DCA loan guarantee but was strategically expanded to support additional financial institutions who requested technical assistance in providing renewable energy loans, encourage equity investments into appropriate renewable energy companies, and advocate for government policies and programs that increase lending from financial institutions to renewable energy projects.

Component 3: Provide training standards promotion

A challenge of promoting RE/EE solutions in Nigeria is the lack of qualified technical staff to install and maintain systems. Poorly installed systems erode the confidence of Nigerians in the viability of RE to meet their energy needs. A relatively small percentage of Nigerian technical staff possesses skills and specific training up to international standards. Additionally, there is low public understanding of the financial and environmental benefits of the use of clean energy. Through Component 3, REEEP increases the technical capacity of RE/EE installers in country and promotes practitioner certification and equipment standards for the sector.

Results

During the tenure of the project, REEEP was able to leverage $2.1 million in financing for RE/EE projects from both domestic and international investors. This funding enabled 16,635 connections of 2.15 megawatts of power either through off- or on-grid sources. This means about 262,000 Nigerians received clean and reliable energy for the first time, which resulted in 85,000 GJ of energy saved due to the use of more efficient technologies compared to diesel or petrol. Environmentally, these connections reduced or sequestered 4.5 million metric tons of CO_2.



Recommended Vendor List

PHOTO: © 2018 BOBBY NEPTUNE FOR WINROCK INTERNATIONAL

The Family

A family walks through the town of Gbamu Gbamu in southeastern Nigeria. What you may not notice in this picture is the electricity poles in the background. But for this family, it's a sign of future promise. Thanks to a recently installed solar power mini grid, these poles and wires will bring clean and reliable energy to a town that never had this before. The impact will be hard to overestimate: safer energy, job creation, higher living standards, and education improvements – overall, better opportunities for all of the town's residents.

Technical Assessments

In order to enable developers to access finance and encourage banks and other investors to lend to the sector, REEEP provides financial due diligence and conducts technical assessments of RE/EE companies. This can help assist banks to make more informed decisions regarding any financial transactions with those firms. The Recommended Vendor List in this document includes all of the companies that passed REEEP's technical and financial assessments.

As part of ensuring the sustainability of REEEP's efforts after the program closes, REEEP is providing here a detailed description of the methodology behind the technical assessments. It is hoped that such an explanation can support financiers and investors to better utilize the recommended vendor list to meet their own needs, resulting in increased funding to the renewable energy sector.

Methodology

It was particularly important for REEEP to devise a quantifiable rating system so that the process is not subjective and can be utilized, and improved upon, easily by interested partners. The assessment covers all types of products, including micro, PICO, street lighting, PV installations, solar home systems, commercial, and industrial. Assessments take place through site visits, product demonstrations, speaking with references and clients, and extensive discussions with company representatives on the firm's capabilities and products.

Companies are assessed on the following categories: business characteristics, financial indicators, technical capabilities, and technical knowledge. These are not weighted equally. For example, technical capabilities and technical knowledge have the highest weight because these categories are considered the most essential for successful and high quality projects.

Within each category, companies are graded 0-5 on many sub-indicators, which are outlined below.

Business Profile

This includes basic information about the company, including the type of business structure, number of years established and incorporated, and number of employees. Certain processes and capabilities are graded on their strength, such as accounting procedures, office presence, and operations and logistics. The fact that a company has a physical office space is particularly important because many banking institutions will not lend to companies that do not have an office.

The education and experience of staff is taken into account, as well as the company's geographic coverage. Initially REEEP asked for CVs of staff; however, experience suggests that many companies exaggerate the experience of staff on CVs, so that it is more accurate to assess the experience and knowledge of staff members in person.

Financial Indicators

Key financial performance indicators are collected and assessed, including turnover, bonded license, warranties, guarantees, and the provision of different financial arrangements for consumers, such as credit arrangements; lease financing; and partnerships with third party financial providers.

Technical Capabilities

This portion of the assessment captures the number and wattage of previous installations performed by the company and the types and capabilities of the products sold or installed by the firm. For example, the efficiency of solar PV panels, whether for off- or on-grid, and the IEC and BS of products are noted. Whether the company has any affiliations with international manufacturers or certification bodies is also considered.

Technical Knowledge

To ensure that companies have the requisite technical capabilities, the REEEP assessor speaks with the company's technical experts to evaluates whether they understand key concepts of RE/EE projects. This includes characteristics like the correct orientation of solar panels during dry and rainy seasons or the efficiency rate of solar panels.

Site Visits

Although ideally the assessor would visit as many sites as possible, REEEP recommends visiting at least two sites. Site visits tend to require about three hours each.

These are particularly important because they enable the assessor to tell relatively quickly whether the company has been honest throughout the assessment about their skills and expertise. In addition, a recent trend in Nigeria is companies that have an overreliance on subcontractors, which results in less efficient use of project funds. Often site visits can reveal rather easily whether a company can indeed do what they say they can or whether they would bring in a subcontractor, which could push up the price or drive down the quality. For example, if the company technical representative does not know how to answer questions like where the batteries are located in their residential compound site, how many kilowatts the system generates, or how the installation was done, this raises immediate red flags. Additionally, the assessor should also ask clients and customers questions during a site visit to better understand the performance and functionality of the system.

Improvements and Adaptations Welcome

Given REEEP's experience carrying out technical assessments and monitoring the results of those companies that have acquired finance, REEEP believes that this methodology can be a valuable tool for determining a company's ability to meet the technical requirements of a given renewable energy project. Those considering working with or lending to these companies should consider these assessments as one part of a more comprehensive evaluation of the vendors. REEEP hopes that the template can be a livable document carried on by partners who can improve upon it and adapt it to fit their needs, as well as the changing sector.

Recommended Vendor List

LAGOS

A Stevens Company Ltd

Expertise	Contact Information
• Solar • Inverter technologies • Wind turbines	• Dr. Sunny Akpoyibo • KM 40 Lagos Ibadan Expressway • astevenltd@yahoo.com • 0706 227 3271; 0805 620 1483 • Astevenltd.com

A4 and T Technology

Expertise	Contact Information
• Solar • Inverter technologies	• Ayo Ademilua • 18 Nana Okuribido St. Ismail Est. Maryland Lagos • ayodeji@a4integrated.com • 0816 547 1372 • A4integrated.com

Absort Solutions Ltd

Expertise	Contact Information
• Solar home systems (DC/AC) • Solar street lights • Solar hybrid systems	• Abayomi Adesote • No. 17 Kayode Anifowoshe St. River Valley Estate, Ojodu Beger • info@absortsolutions.com • 0806 158 477 • Absortsolutions.com

Auxano Solar Co. Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Chukwudi Umezulora • 367 Old Ojo Rd, Dunamis House, Satellite Town, Lagos • info@auxanosolar.com • 0806 604 9925 • Auxanosolar.com

Avenam Links International Ltd

Expertise	Contact Information
• Biogas • Solar power	• Chioma Nima Ani • Lagos State Abbatior Oko-Oba, Agege • 15 Beco Estate, Magoro, Lagos • anin@avenamlinks.com • 0703 007 0291

Chriscent Energy Ltd

Expertise	Contact Information
• Biomass feedstock export (PKS) • Palm kernel shell	• Samuel Abedeji • 19c Marine Rd, Apapa, Lagos • info@chriscentenergy.com • 0703 280 7277

LAGOS CONTINUED

Cloud Energy

Expertise	Contact Information
• Solar lanterns • Solar home systems • Solar heaters and appliances	• Theophilus Nweke • 85 Ikorodu Rd, Fadeyi, Lagos • theo@cloudenergy.com.ng • 0817 778 8002

Cygnet Properties Ltd

Expertise	Contact Information
• Energy efficient buildings with solar incorporated	• Adebowale Sanda • 3rd Floor, Western House, 8/10 Broad Street, Lagos • debosanda@yahoo.com • 0807 327 9141

Edge Technologies Solar Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Emmanuel Ebmehi • 231 Herbery Macualay Rd, Yaba, Lagos • edgetechnologiessolarltd@gmail.com • 0806 576 7299

Emel Advanced Power Solution

Expertise	Contact Information
• Solar • Inverter technologies	• Ayo Balogun • 10 Ijora Cause Way, Lagos • Ayodele_b_balogun@yahoo.com • 0807 300 0864 • Emelgroup.com

Folub Electrik Services

Expertise	Contact Information
• Solar mobile generators • Solar lanterns	• Bode Adefolu • Lagos TV Complex, Lateef Jakande Rd, Agidingbi, Ikeji, Lagos • bodeadefolu@yahoo.com • 0802 315 4025

SMEFUNDS/GE Biofuels/Go Solar

Expertise	Contact Information
• Biofuels • Solar mini grids • Solar home systems	• Femi Oye • 18b Ogundana St, Allen Ave., Ikeja, Lagos • F.oye@smefunds.com • 0803 708 0251 • Smefunds.com

Green Power Utility

Expertise	Contact Information
• Gas generators	• Roy Ratcheep • Ogun Free Trade Zone, Ado-Odo, Ota, Ogun State • enquiries@greenpowerutility.com • 0803 957 0822; 0812 068 2899 • Greenpowerutility.com

LAGOS CONTINUED

GREENPOWER OVERSEAS LTD

Expertise	Contact Information
• Solar home systems	• Bamidele Faparusi • 35B Unity Rd, Off Bank Anthony Way, Ikeja, Lagos • B.faparusi@greenpowernig.com • 0803 719 1033

KATIKA ENERGY LTD

Expertise	Contact Information
• Solar systems above 5kW	• Gabriel Kajero • 6th Floor, Fortune Towers, Alakija St, Victoria Island, Lagos • Gabriel.kajero@katikaenergy.com • 0706 624 6482 • Katikaenergy.com

KENOL NIGERIA LTD

Expertise	Contact Information
• Solar • Inverter technologies • Electrical • Civil • Mechanical • Hydro	• Ruth Igwe & Olowe Olawale • Plot 9 Block D, Junaid Dosunmu St, Agidingbi, Ikeja, Lagos • info@kenol-ng.com; enquiry@kenol-ng.com • 0806 154 4822

OGINNI EVER INCREASING ENT (OEIE)

Expertise	Contact Information
• Solar home systems	• Debo Ladejola • 11 Aguleri Dr, Divine Homes, Thomas Estate, Lekki, Lagos • samladejola@gmail.com • 0803 154 4822

PERFECTHOLDERS NIGERIA LTD

Expertise	Contact Information
• Solar • Inverter technology • Wind turbines	• Adedigba Yusuf Abiola • 30 Oba Akran Ave, Ikeja, Lagos • perfectholdersltd@yahoo.com • 0806 845 1727; 0803 408 1282

PRIVATE NETWORKS NIGERIA LTD

Expertise	Contact Information
• Solar • Inverter technologies	• Abdulraman Abiola-Odunowo • 1 Oremeji St, Ilupeju, Lagos • aabiolaodunowo@pnngroup.net • 0802 290 1232 • Pnngroup.net

LAGOS CONTINUED

PRIVIDA ENERGY

Expertise	Contact Information
• Solar • Inverter technologies • Wind turbines	• Omo Akalumhe • Block 98, Plot 1B, Omorinre Johnson St. Lekki, Phase I • oakalumbhe@gmail.com; o.akalumhe@prividaenergy.com • 0803 555 2124

PROTEK POWER & ENERGY LTD

Expertise	Contact Information
• Solar PV systems • Solar heaters	• Akinjide Obe • Block T, Plot 13, Ramat Crescent, Ogudu, Lagos • info@protekng.com • 0802 536 8671 • Protekng.com

RUBITEC LTD

Expertise	Contact Information
• Solar systems above 5kW • Solar mini grids	• Bolade Soremekun • 72 Adeniyi Jones, Ikeja, Lagos • info@rubitecsolar.com • 0803 449 9670; 0177 39108 • Rubitecsolar.com

SILICON PROJECT LTD

Expertise	Contact Information
• Solar home systems (DC/AC) • Solar street lights • Solar hybrid power	• Biliaminu Jimoh • 3 Babshola Jimoh St, Abranje Rd, Ikotun, Lagos • info@siliconsprojects.com; ccfavouredbilly@gmail.com • 0706 544 8377 • Siliconsprojects.com

SIMAN ENGINEERING LTD

Expertise	Contact Information
• SPV technology • Biomass (gasifiers) • Biogas	• Anita Nana Okuribido • 25 Silvia Cresent, Adjacent Zenith Bank, Anthony Village, Lagos • anitarenewableenergy@gmail.com; anitaokuribido@simanengineering.com • 0803 494 9898 • Simanengineeringltd.com

SOLARMATE ENGINEERING LTD

Expertise	Contact Information
• Solar systems above 5kW	• Dotun Tokun • 67 Adisa Bashua St, Surulere, Lagos • info@solarmateng.com • 0703 800 0729; 0177 40887 • Solarmateng.com

LAGOS CONTINUED

Starsight Power

Expertise	Contact Information
• Solar systems above 15kW • Power-as-a-service	• Tony Carr • 9 Ondo St, Osborne Foreshaw Estate, Ikoyi, Lagos • tcarr@starsightlimited.com • 0813 067 3599 • Starsightlimited.com

Technology Support & Infrastructure Energy Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Olabode Sunday Adefolu • LTV Complex, Lateef Jakande Rd, Agindingbi, Ikeja, Lagos • bodeadefolu@yahoo.com • 0802 315 4025; 0809 815 4025 • Folubeletrik.com

Vanpeux Global Synergy Ltd

Expertise	Contact Information
• Solar home systems • Solar PV systems above 5kW	• Ovoke Ekrebe • 15 Bajulaye Rd, Shomolu, Lagos State • vanpeuxglobalsynergyltd@yahoo.com; ovoke.ekrebe@vanpeaux.com • 0905 390 2950; 0805 273 5910

Wandell International Nigeria Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Rajneesh Gupta • Plot 5B, Acme Rd, Ogba, Lagos • rajneesh@simba.com.ng • 0700 111 2233 • Simba.com.ng

Zagos Services Ltd

Expertise	Contact Information
• Biogel and stoves	• Kingsley Kanu • B12 Primaltek Plaza, Akowonjo Rd, Lagos • zagosservices@yahoo.com • 0803 321 6892

ABUJA

Blue Camel Ltd

Expertise	Contact Information
• Solar systems above 100 kW • Solar home systems • Solar heaters • Solar borehole equipment	• Suleiman Yusef • Suite 4/6 Angels Plaza, Iadoke Akintola Boulevard, Garki II, Abuja • yusufsuleiman@bluecamel.us • 0803 326 4484; 0817 326 4484 • Bluecamel.com.ng

ABUJA CONTINUED

TXT Lightpower Solution Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Yuri Tsitrinbaun • 167 Ademola Adetokumbo Rd, Wuse II, Abuja • Yuri.t@nova-lumos.com

NIGER

Roshan Global Services Ltd

Expertise	Contact Information
• Cookstoves • Briquetting	• Happy Amos • Zhaipe-Dikko Rd, Near Former Crusher, Dikko, Gurara LGA, Niger State • happyamos@ygmail.com • 0806 916 9129

RIVERS

BIV Integrated Service Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Adebayo Igunmu • 24 Ken Saro Wiwa Rd, Rivers State • bivintserv@gmail.com • 0803 395 1119

GVE Projects

Expertise	Contact Information
• Solar • Inverter technologies	• Ifeanyi Orajaka • WINORAC Engineering Building, Plot 34 Boskel Rd, Off KM 13 Port Harcourt/Aba Expressway, Port Harcourt, Rivers State • info@gve-group.com • 0806 407 5280; 0803 933 6366; 0806 517 6177 • Gve-group.com

OEIE Ltd

Expertise	Contact Information
• Solar • Wind • Inverter technologies	• Samuel Ladejola • 58 Old Refinery Rd, Elelenwo, Rivers State • samladejola@gmail.com; info@oeiesolar.com • 0803 335 4370

Primos Integrated Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Adeyeba Thompson Olusegun • 43 Old Aba Rd, Rivers State • Segun-yeba@yahoo.com • 0803 707 4225

OYO

Ashdam Solar Company Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Adeyemi Asaleye • University of Ibadan Bookshop Basement • ashdamsolar@gmail.com • 0803 397 8070

Geedove & Mack Nig Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Oluwatosin Makanjuola • 50 Oyo Rd, Sango Ibadan • tosindirect@gmail.com • 0818 524 8521

ONDO

Quintas Renewable Energy Solution Ltd

Expertise	Contact Information
• Biomass energy generation • Solar power technology	• Dr. Omotayo Dairo • 133 Oyemeken Rd, Akure, Ondo State • Tayo.dairo@quintasenergies.com • 0909 830 2006; 0803 451 0340

UYO

Agilet Technologies Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Emmanuel Anwana • No. 118, Oron Rd, Uyo • agiletechnologiesng@yahoo.com • 0808 810 4700; 0818 942 6899

KADUNA

Rana World Tech Shop Ltd

Expertise	Contact Information
• Solar • Inverter technologies • Wind turbines	• Dr. Tajudeen Humble Sikiru • No. 6 Biniki St, Narayi, Kaduna • Suite B14, First Floor JS Innovation Plaza Stadium Roundabout, Kaduna • info@ranaworldtech.com • 0706 560 1294; 0809 617 7110 • Ranaworldtech.com

Sosai Renewable Energies Co.

Expertise	Contact Information
• Solar • Wind turbines • Inverter technologies	• Habiba Ali • No. 1a Yakuba Gowon Way, besides Mr. Biggs, Kaduna • habiba@sosairen.org • 0803 311 0130; 0708 058 1613

DELTA

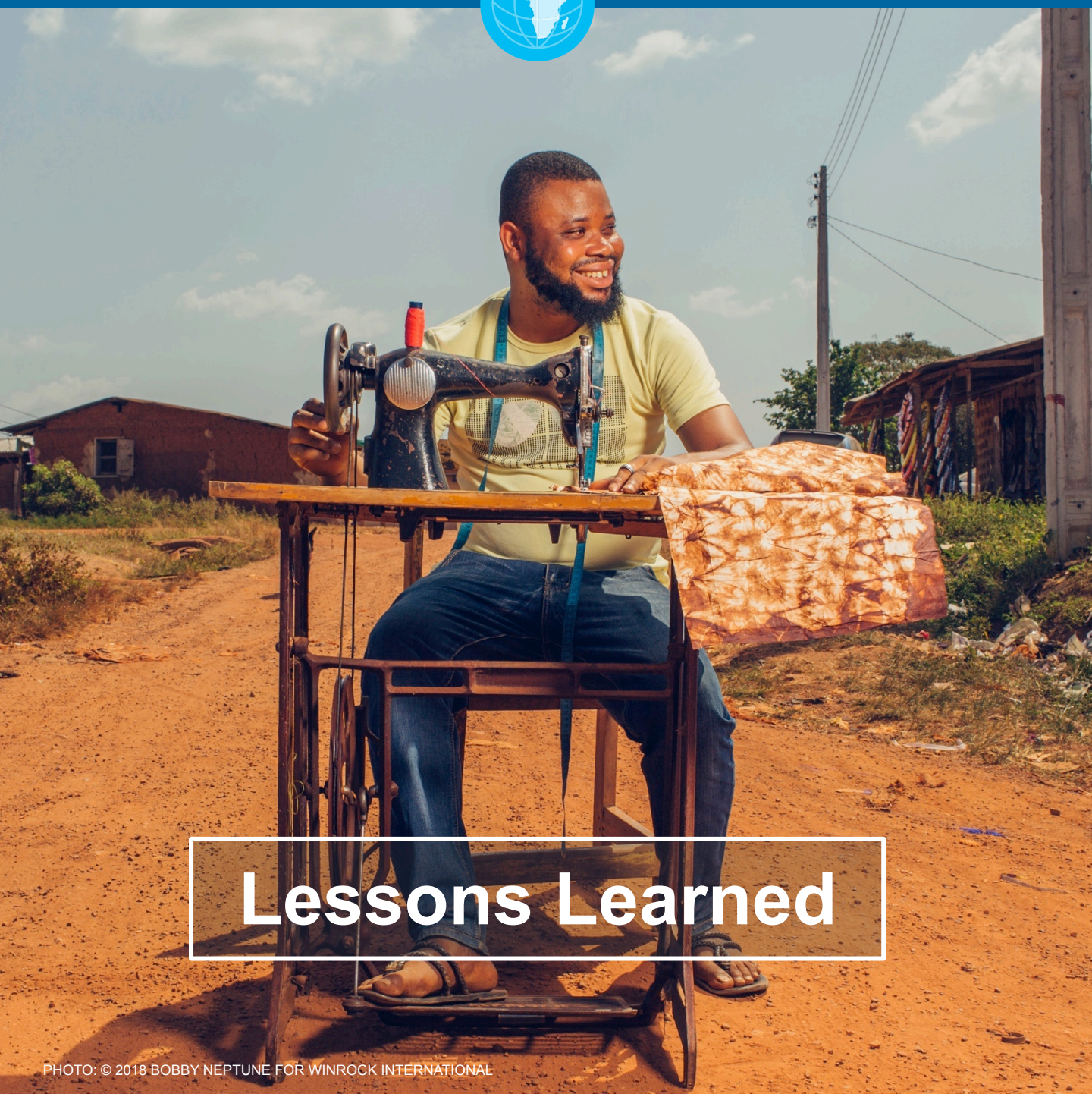
Genesis Chemical Ltd

Expertise	Contact Information
• Solar • Inverter technologies • Wind turbines	• Franklin Omusi • 52 Dennis Osadebey Way, Asaba, Delta State • franklinomus@gmail.com; genesiscopowersystem.com • 0803 400 3767

IMO

EcoPower Resources Ltd

Expertise	Contact Information
• Solar • Inverter technologies	• Kevin Mbawuike • 74 Wetheral Rd, Imo State • ecopoweresources@yahoo.com • 0803 709 7112



Lessons Learned

PHOTO: © 2018 BOBBY NEPTUNE FOR WINROCK INTERNATIONAL

The Tailor

Lateef Jimoh knows that a certain amount of legwork is always going to be a part of his job. As a tailor, Jimoh typically takes orders from his fellow villagers in Gbamu Gbamu and then makes the four-hour round trip journey to Lagos to pick up the fabric he needs to actually create the garments. But the bumpy trips he takes twice a week on a motorcycle to pick up diesel for the generator he needs to run his six sewing machines is something he would love to eliminate. "Instead of having to travel to town to buy diesel, that is an advantage for me," says Jimoh, who moved to Gbamu Gbamu from Ghana to be closer to family eight years ago. Besides enjoying a quieter work environment once he replaces the diesel generator with electricity from the solar-powered mini grid, Jimoh expects to have more money in his pocket. "It cuts down the expense with the power and having to travel to town to buy fuel," he says. "It will boost my business and make me produce more."

Over the course of the four-year program, REEEP, funded by USAID and Power Africa, has been exposed to a variety of challenges, some anticipated and some not. There is still much work to do in the renewable energy and energy efficiency (RE/EE) sector, particularly regarding access to finance for project developers. As REEEP occupied a unique niche in the sector, it is vital that the lessons learned and knowledge attained by the project is not simply lost. This section is meant for donors, government, project developers, partners, domestic lending institutions, international investors, and other stakeholders. We hope the lessons learned by REEEP can be carried forward by those who are passionate about making the solar sector in Nigeria shine brightly.

REEEP categorizes the lessons it's learned into four broad categories: a) access to markets b) access to finance c) government policy and regulations and d) technical capacity.

Access to Markets

The state of energy access in Nigeria is dire; Nigeria would need to grow its electricity sector by 40 times[1] to match the energy availability of South Africa, a country with 70% less people and considered substandard in electricity provision. With such little energy access, one would expect high demand for RE/EE energy solutions in Nigeria; however, in reality demand is low. This is driven by a lack of awareness of RE solutions by consumers and a distorted perception of poor functionality and quality by those that are familiar with such products.

Lack of Awareness of RE Solutions

REEEP conducted a survey in 2015 to determine the opportunities and constraints to the RE sector in Nigeria. The survey showed that 85% of households and 61% of small and medium enterprises (SMEs) in Nigeria had never seen an advertisement for RE products or services[2]. Due to the high upfront costs of RE installation, 70% of households and 91% of SMEs do not think future savings are enough of an incentive to adopt the technology. REEEP has heard similar assertions from RE businesses that say many consumers are not even aware that RE solutions exist.

To address this issue, REEEP recommends the Nigerian government create an awareness campaign that promotes RE solutions as reliable and cost effective. The Renewable Energy Association of Nigeria (REAN), which is made up of RE developers, is also well-placed to conduct this type of campaign since they would benefit directly from increased demand. RE businesses also have a responsibility to engage in product marketing, beyond simple sales, and address the lack of incentives for customers to adopt RE systems by offering competitive pricing and providing functional products and quality services.

Perception of Poor Quality

Nigerians perceive renewable energy projects as unreliable and dysfunctional due to a number of high profile projects that have failed throughout Nigeria and across Africa. A study conducted by USAID REEEP found that only 5% of households and 20% of SMEs trust the quality of renewable energy products in Nigeria[3]. Solar projects fail for a variety of reasons, including corruption in the procurement process, lack of service and maintenance, the drive to cut costs by employing cheap equipment, and finally the lack of capacity and technical knowledge by those installing the systems.

One solution to the perception problem is to ensure that any donor projects providing solar energy do not encourage bid competition solely on the basis of price. When developers are forced to compete on price alone, they cut costs, leading to a race to the bottom in terms of low quality products, shoddy installation, and removal of maintenance costs, which are essential to the functioning of renewable energy systems. These projects become a liability to the entire RE market in Nigeria.

Furthermore, training developers on quality installations and maintenance, as well as promoting certification standards in the market, will lead to better quality systems, improving the perception of solar projects in Nigeria. These are discussed further in the Technical Capacity section.

[1] World Bank, 2013, SE4ALL Global Tracking Framework
[2] Renewable Energy Market Opportunities Assessment in Nigeria, Chimaobi James Agwu, USAID REEEP, 2015
[3] ibid

Access to Finance

Across the entire financial system in Nigeria (not only the RE sector), local banks are lending at unfavorable rates, due to high country risk, a foreign exchange crisis that began in 2015, and a lack of long-term funding. Banks offer short tenures, typically no more than 1.5 years, high interest rates of about 28%, and high collateral requirements of over 100%. Due to the infrastructure nature, the high upfront costs and the long payback period of RE projects, these are impossible terms for RE companies. Although international finance is an option for some companies, this increases a company's FX exposure and is not a long-term solution to the root of the problem. Furthermore, REEEP overestimated the likelihood that banks would be willing to lend to SMEs. Instead, domestic financiers are reluctant to lend to SMEs unless they have a contract with a large, credit-worthy entity. Overall, there is a lack of available financing in Nigeria.

Because these are system-wide problems, donors and other stakeholders in the RE sector have little ability to affect systematic change here. However, through its work unlocking finance for RE companies, REEEP has identified a few ways to solve certain characteristics of the access to finance quandary.

Lenders unfamiliarity with RE/EE sector

Part of the reason why banks offer such unfriendly terms to RE/EE developers is because they do not understand the sector. Given how nascent the industry is (and the poor quality of some systems, as discussed in the previous section) this is not difficult to understand. Banks simply do not know how to evaluate risk in the renewable energy sector.

By working directly with local lending institutions, REEEP provided technical assistance and group training sessions, depending on the needs of each lending institution. These services provided the knowledge needed for banks to appropriately assess the credit risk of RE/EE firms and projects in Nigeria. In addition, REEEP's services convinced some microfinance institutions to offer consumer financing products to customers to access RE products. On the other hand, REEEP provided advisory services to developers on how to access finance so that they better understand what banks are looking for in a lending partner.

These services have resulted in real progress since the start of the REEEP program four years ago. Banks are closer to lending than ever before, and many developers have put the right structures in place to access that finance. Donors should continue this momentum by providing these services until a turning point in the sector has been reached. REEEP expects this to occur within the next few years.

Addressing Lack of Credit History Through a Credit Guarantee

Part of REEEP's mandate was to maintain a pipeline of bankable projects for USAID's Development Credit Authority (DCA) implemented by Ecobank. While a credit guarantee was useful to address the issue of high collateral requirements and lack of credit history of RE developers, it did not change the short tenures and high interest rates of domestic lending institutions.

REEEP proposes two guarantee structures that could work better in the future. Each structure would increase options and foster competition to finance RE projects.

- **Basket approach**: Setting up a portfolio with multiple banks that have access to the DCA could result in increased competition to make use of it. Each bank would be given a minimum amount, and those institutions that use it would be able to access additional money. This would prevent USAID from betting on one single bank, which might not be interested or able to lend to the RE/EE sector.
- **Portable guarantee**: This structure would guarantee a project that can then be taken to any lending institution. However, this would require USAID to manage the financial due diligence, which might not be as desirable for USAID.

In the end, DCAs are useful only if domestic financiers are on the cusp of lending to renewables. The FX crisis and resulting economic downturn put a halt on lending for about two years, preventing the DCA from reaching its full potential. Since REEEP believes Nigeria will reach that turning point in the next few years, it is worthwhile creating a second DCA under one of the two structures proposed above. This would require an accurate market assessment of the lending climate in the country for renewable energy projects.

Lack of Consumer Financing Options for Commercial and Solar Home Systems

REEEP calculated the inflection point where the monthly payback for an RE/EE system that replaces a traditional generator is lower than the monthly cost of running that generator. This is achieved with consumer financing at 9% over five years. This is the tipping point (assuming 100% financing) where replacing a current diesel or petrol generator with an equivalent solar system results in immediate monthly savings of a customer's energy bill. Making available a consumer-financing product to achieve this would be a great catalyst for the sector, propelling uptake in the market. But in order to do this, small businesses that are providing low consumer finance need to receive similar term financing from financial institutions on the back end.

Leaseback and Pay-As-You-Go (PAYG) systems reduce entry barriers for consumers by allowing them to pay small, affordable increments for electricity as they need it, rather than demanding a high up-front cost for installation and service. While these options are important to drive consumer uptake, they push the financial burden backwards along the value chain from the consumers to the SMEs. This problem is particularly exacerbated in the solar home systems (SHS) and commercial segment as pico solar products already have a financing window through microfinance institutions.

Similarly, there has been much talk about the lack of mobile money options in Nigeria. While this would help cut costs for developers to access payments from consumers, mobile money is not the reason why developers cannot access the finance they need. A mobile money system in Nigeria would not solve the financing constraints in Nigeria.

Management Buy-In Required for Nigerian Lending Institutions

For a project like REEEP that is supporting developers to access finance, it is important to get buy-in from the right people within Nigerian lending institutions. Hierarchy is culturally important in Nigeria so it is imperative to understand who has the authority to make decisions regarding lending portfolios. If the wrong person is consulted first and the information is not passed through the right channels, nothing will change. Speaking with the right manager is key to obtaining decisions after just a couple of meetings. For transnational banks, decision makers might not be in country so it is even more important to meet with them in person so that the request is not lost or diluted.

Intermediaries Required to Reduce International Stigma

REEEP's experience working with international financiers has shown that there is a stigma attached to doing business in Nigeria. REEEP often acted as an intermediary between international investors and Nigerian businesses by helping investors navigate the Nigerian business environment. For example, REEEP and GIZ's Nigerian Energy Support Programme (NESP) created Due Diligence Guidelines to assist international financiers to understand what types of documents a stable business in Nigeria should have. The market still requires the presence of such an intermediary. Donors can easily replicate this until more large-scale RE projects become successful and this stigma is naturally reduced over the course of time.

Split-Asset Model Could Enable Access to Financing

Off-grid mini grids require that developers pay for both the generation and the distribution costs, which results in a high financial burden. Due to the lack of access to finance, this hurdle is almost impossible to overcome. This is not typical; in most countries companies receive subsidies from the government or grants to finance the grid's infrastructure.

Instead of trying to convince banks and other financial institutions to invest in a mini grid project as a whole, REEEP promotes a "split-asset model," which separates the distribution and generation components. Distribution costs are then shopped around for grants, while developers approach banks for loans for the generation portion, easing the financial burden for developers and lowering risk for banks.

Communities Should Not Own the Grid

Many international donors are restricted from providing grants to Nigerian developers for a variety of reasons. As a result, there is a movement to give ownership of grant-funded grids in mini grid projects to the community. However, REEEP does not recommend this practice. With this method it is unclear who is responsible for regular service and maintenance. Due to the newness of this technology, local governments and communities are not familiar with best practices of the sector. Plus, given the plethora of unqualified suppliers and low quality equipment in Nigeria, it is particularly easy for communities to end up with inadequate arrangements for long-term upkeep of the system. Additionally, community ownership runs the risk of bringing politics into system maintenance.

By giving the responsibility of maintenance and upkeep to quality companies whose services, equipment, and reputation are vetted, donors can better sustain benefits to the community. Additionally, building strong local suppliers in the sector will create jobs, enhance competitiveness of SMEs, and result in more off-grid mini-grid systems established throughout the country as RE companies grow. Therefore, donors should proceed with caution when giving ownership to the communities and should prioritize working with vetted local suppliers to manage the systems.

Government Policies and Regulations

Overall, the renewable energy sector is characterized by a regulatory void and lack of incentives for both consumers (private and commercial) and industry to enter into the marketplace. To address these issues REEEP recommends the government of Nigeria institute the following incentives and regulations.

Regulatory Void

One low hanging fruit for the government is to improve the regulation to protect off-grid mini grid operators in the case of grid encroachment. Off-grid mini grids are the most effective option to power communities that are too rural to be connected on-grid in the short-term. However, when grid encroachment takes place, which occurs fairly regularly, distribution companies (DISCOS) are legally obligated to manage the distribution of on-grid power. Operators then have two options: they can either set up a Power Purchase Agreement (PPA) and sell the power to DISCOS or the DISCOS can buy the operator out. The rate at which DISCOS buy out the operator should be calculated through a rigorous process that takes into account a means to incentivize operators to develop off-grid projects, while also offering a fair price to DISCOs. Currently, mini grid regulations do have procedures for grid encroachment; however, the current calculation procedure does not provide adequate protection for mini grid operators.

Instituting A Product Registry

Developed nations regulate RE products and components that are imported into or are manufactured in the nation. The Nigerian government does not currently have the capacity or resources to enact such a system. Therefore, the idea of formulating a product registry of acceptable products and components was proposed by stakeholders. REEEP participated in these discussions and helped flesh out this idea in order to put it into practice.

The concept was to create a list of acceptable products and components based on those that are listed by international standard organizations or use the World Bank Group's "Lighting Global Quality Standards" list. Initially, this was conceived as a set of requirements issued by the REAN and required by Nigerian banks or financiers, so that it could be implemented relatively quickly. However, due to the high percentage of equipment tailor-made for specific developers, the end result would be a limitation on Nigerian companies' ability to be creative and flexible in meeting the needs of a given project. Nonetheless, considering the large number of RE/EE project failures caused by poor equipment and the large perception problem this has caused for the sector, the industry would do well to self-regulate and impose strict equipment standards. Although this may limit current business models and innovation, improving the reputation of technologies with consumers is of vital importance if this sector is to grow.

Lack of Incentives for Private & Commercial Consumers

As explained in the Access to Markets section, many consumers do not believe there are enough incentives to switch to renewable energy systems. The Nigerian government can employ a variety of strategies to incentivize consumers to take up solar energy and create much-needed demand in the country.

- Reduce property tax for households or commercial entities that utilize solar
- Remove VAT from solar and renewable energy products
- Provide interest rate rebates for RE loans
- Provide corporate tax breaks for corporations that invest in green energies, such as telecoms or banks
- Net Metering: Enable consumers to sell energy back to the grid
    - Most renewable energy systems are designed to handle the peak hours of power usage. Therefore, during off-peak hours there is electricity that could be sold back onto the grid. By enabling consumers to either profit or reduce their own electricity costs, the government can increase the uptake by consumers of renewable energies. Additionally, this type of model would lead to more effective and efficient systems that spread the energy to those who are using it, further reducing greenhouse gas emissions.

Lack of Incentives for Industry

Although the government does not charge import duties on renewable energy components, there is room for improvement in the government's ability to enforce this policy equally for all types of RE equipment. Additionally, batteries for solar components are not included in the duty free list. Since batteries are essential to the performance and utility of solar systems, as well as one of the main cost drivers, these taxes should be eliminated. By doing this, the government can significantly decrease the basic costs of doing business for solar companies and ensure their competitiveness with traditional forms of energy.

Technical Capacity

A small number of good quality suppliers in Nigeria do exist. REEEP cannot emphasize this point enough. Not only do quality suppliers exist in Nigeria, these same highly qualified developers are not operating at their full capacity. In other words, supply is not the issue preventing the sector from growing; rather, demand for RE/EE products is. Therefore, while technical capacity can certainly be strengthened for a wider pool of suppliers, REEEP believes that the more pressing constraints for the industry are those related to access to markets, access to finance, and lack of regulations and incentives.

That being said, as new players enter the market, building up their technical capacity to provide quality products and services will be vital to addressing the poor perception of the solar industry and increasing competition for a healthier sector.

Underperforming Technical Staff

Until recently, Nigeria did not have the training and capacity building infrastructure needed to grow the sector and ensure qualified RE/EE firms. To resolve this REEEP, in close partnership with NESP, developed a set of technical training curriculum that provides the foundation for a practitioner certification system using an independent third party certification body. World-class international renewable energy specialists produced material for seven courses. The curriculum provides over 800-pages of detailed content, which is up to international best practices and tailored to fit the unique needs of Nigeria. REEEP and NESP also built the capacity of 12 training centers across the country to conduct the training on a commercially sustainable basis. See pages 28 and 29 for a list of training courses and training centers.

Developing the curriculum, supporting training centers, and training 79 developers was a major achievement; however, further support is needed. The 12 training centers are at varying degrees of capability, in terms of conducting the training and marketing the courses. While GIZ's NESP II will manage this activity going forward, other stakeholders can play a supporting effort to ensure developers continue to participate and training centers maintain high quality training services.

Promoting Industry-Wide Certification

Furthermore, the industry as a whole should demand that all participants in the sector are certified under this system and adhere to a set of required qualifications. The result would ensure quality installations and have a positive effect on reducing the perception problem. REEEP and NESP have developed a simple, low cost national certification system for RE/EE practitioners that can be easily replicated in other ECOWAS countries. Rather than accrediting individual training centers to ensure quality, the REEEP and NESP system uses a third party independent certification body. This strategy will require far less resources and less politics to enforce.

In order to cut down on any conflict of interest, it is particularly important that the certifying body is independent from the training centers and is continuously committed to updating its standards to best practices and country needs. REEEP and NESP have conducted an analysis of groups with the potential to take over this service and narrowed it down to two agencies. NESP II will make the final decision and work with that organization to successfully implement the certifications. Other industry stakeholders can support this work by promoting, accepting and adopting this certification system. For example, government, donors, investors, and lending institutions can require the certifications on their tenders. As more established institutions accept and require these standards, the certifications will obtain industry acceptance, suppliers will respond by becoming certified, and more RE projects will be of higher quality.

The Future of RE/EE in Nigeria

This document discusses the knowledge REEEP attained during the tenure of its four-year project addressing the barriers of access to finance for RE/EE companies in Nigeria. REEEP's recommendations can be categorized into four key aspects of the sector: access to markets, access to finance, government policies and regulations, and capacity of RE/EE suppliers. By working together to tackle each category, REEEP believes RE/EE stakeholders can boost the renewable energy sector, contribute to development outcomes, and fuel the Nigerian economy.

RE/EE firms in Nigeria have trouble accessing the market due to a lack of awareness among consumers of RE solutions, as well as the perception of poor quality products and services. Providing quality training to suppliers and promoting certification standards for the industry as a whole can improve quality and perception. Government policies and regulations can address the lack of incentives that currently exist in the marketplace for both consumers and suppliers. Regulations can also address the quality perception gap by ensuring products are of high standards.

Access to finance remains a major obstacle, especially due to the FX crisis and economic downturn which essentially put a halt to all financing activity in the sector. Despite this, REEEP, in partnership with other stakeholders, has had successes in assisting RE/EE developers to access finance and to improve their knowledge base. REEEP has supported domestic lending institutions to better understand the risks associated with the sector and the needs and requirements of its stakeholders. The curriculum developed by REEEP and NESP provides the only qualifying standards in the country and will continue to secure further benefits as the industry accepts them. While the sector still requires assistance from donors, REEEP believes the domestic banking industry is on the cusp of exploiting the opportunities in the RE/EE sector. Therefore, it is crucial that all stakeholders - donors, government, domestic lending institutions, international investors, and non-profit partners - continue to provide support and help maintain the momentum that REEEP and others have built. Despite the many challenges to the sector, REEEP believes the future of RE/EE in Nigeria is bright.

Investment Pipeline

PHOTO: © 2018 BOBBY NEPTUNE FOR WINROCK INTERNATIONAL

The Entrepreneur

On a sunny November day, Lawal Omowumi has ample time to show off how the large blue cocoa dryer she helps run operates. "We load about 30 sacks of the cocoa into this and turn on the generator," she says. "It is normally used in the rainy season. But now there is nothing." Seasons will inevitably change and Omowumi's dryer will be in demand again, though she looks forward to no longer needing to fetch diesel to power the generator that keeps it running. Gbamu Gbamu's solar-powered mini grid will eliminate those tiring and expensive trips. She also sees how a constant supply of electricity will keep the laptop and printer in her office running smoothly, another potential boost to her business. But while Omowumi is eager to reap business benefits, she is equally excited for the changes the mini grid will bring to Nigeria's hot nights. "Normally, villagers sleep outside. But when there is light [meaning solar power] in the midnight they will have fans and sleep there," she says, pointing to the interior of a nearby home. "They sleep inside and enjoy themselves."

ASHDAM SOLAR COMPANY LIMITED

Name of Key Contact Person	Adeyemi E. Asaleye
Address	Ashdam Solar Company Limited, Behind Real Food & Wine, Challenge, Ibadan, Oyo
Email and Telephone Number	ashdamsolar@gmail.com; 0802 718 9340
Capital Seeking	50,000,000 NGN (Debt)
Projects for 2018	Mini grid solar systems for rural areas, PAYG solar package for residential homes, Lease-to-Own solar package for private and commercial use, Solar PV - Biogas Power Plant for agricultural village
Products company utilizes/distributes	Solar Lanterns, Solar Home Systems, Solar System above 5kW, Solar Between 100W and 5kW, Energy Efficient Appliances.

BLUE CAMEL ENERGY LIMITED

Name of Key Contact Person	Yusuf Suleiman
Address	Suite 6 Angeles Plaza, Plot 1243 Ladoke Akintola Boulevard, Garki 2, Abuja
Email and Telephone Number	ceo@bluecamel.us; 0803 326 4484
Capital Seeking	600,000,000 NGN (Equity); 10,000,000 NGN (Debt)
Projects for 2018	We have established a factory in Kaduna State where we have identified and have begun to engage neighbouring factories who are potential off-takers of the 2MW of solar we intend to generate from our factory location. We intend to set up a lead acid battery recycling plant.
Products company utilizes/distributes	Solar Home Systems, Solar Systems from 100W to above 15kW, Solar Heaters, Energy Efficient Appliances, Solar Street/ Garden/Perimeter Lighting, Solar Borehole Equipment, Solar PV Modules, Deep Cycle Batteries, Inverters, UPS Systems

CLOUD ENERGY PHOTOELECTRIC LIMITED

Name of Key Contact Person	Theophilus C. Nweke
Address	85 Ikorodu Road, Fadeyi. Lagos
Email and Telephone Number	theo@cloudenergy.com.ng; 0817 778 8002
Capital Seeking	70,000,000 NGN (Debt or Equity)
Projects for 2018	1. Deployment of Solar home system ranging from Solar lantern to Prepaid Home system of up 10KW for both home and offices and SMES 2. Deployment of Solar Captive power for embedded generation for both Grid and Off grid deployments
Products company utilizes/distributes	Solar Lanterns, Solar Home systems, Solar Between 100watts and 5KW, Solar above 5KW, Solar heaters, Solar efficient Appliances

CREEDS RENEWABLE ENERGY LIMITED

Name of Key Contact Person	Hannah Kabir
Address	Suite A14 TJ 1406 Plaza, 7 Bozoum Street, Wuse II. Abuja
Email and Telephone Number	hkabir@creedsenergy.com; 0803 599 7030
Capital Seeking	20% Equity
Projects for 2018	Captive power systems, PAYG Stand Alone Systems
Products company utilizes/distributes	Solar Home Systems

GEEDOVE & MACK LIMITED

Name of Key Contact Person	Tosin Makanjuola
Address	Suite 18, Esmak Plaza, Akobo, Ibadan. Oyo
Email and Telephone Number	tosindirect@gmail.com; 0818 524 8521
Capital Seeking	5,000,000 NGN (Equity) 15,000,000 NGN (Debt)
Projects for 2018	Solar powered fuel station and solar home system
Products company utilizes/distributes	Solar Systems above 5kW

GOSOLAR AFRICA

Name of Key Contact Person	Femi Oye
Address	18b Ogundana Str, Allen Avenue. Ikeja. Lagos
Email and Telephone Number	f.oye@gosolarAfrica.org; 0803 708 0251
Capital Seeking	900,000,000 NGN (Equity); 200,000,000 NGN (Debt)
Projects for 2018	Solar Mini Grid Solutions
Products company utilizes/distributes	Solar Mini Grid, Solar Home Systems

GREEN ENERGY BIOFUELS

Name of Key Contact Person	Femi Oye
Address	18b Ogundana Str, Allen Avenue. Ikeja. Lagos
Email and Telephone Number	f.oye@gosolarAfrica.org; 0803 708 0251
Capital Seeking	365,000,000 NGN (Equity) 200,000,000 NGN (Debt)
Projects for 2018	BioEthanol Refinery for Clean Cookstoves
Products company utilizes/distributes	Clean Cookstoves

GREENPOWER OVERSEAS LIMITED

Name of Key Contact Person	Olaniyi Johnson Orimisan
Address	35b Unity Road, Off Mobolaji Bank Anthony Way, Ikeja. Lagos
Email and Telephone Number	info@greenpowernig.com; 0812 457 8223, 0803 357 6004
Capital Seeking	335,000,000 NGN (Equity); 1,340,000 NGN (Debt)
Projects for 2018	Design, Supply and Install and Maintain 30kw to 50kw Solar Hybrid Systems for Fifteen (15) Bovas Service Stations, Design, Supply and Install and Maintain 54.9KW Solar Hybrid System for forty (28) Mobil Petrol Stations
Products company utilizes/distributes	Solar Systems above 5kW

KATIKA ENERGY LTD

Name of Key Contact Person	Gabriel Kajero
Address	7th Floor Fortune Towers, Adeyemo Alakija street. Lagos
Email and Telephone Number	gabriel.kajero@katikaenergy.com; +44 770 007 6264
Capital Seeking	5,000,000 NGN (Equity), 1,000,000 NGN (Debt)
Projects for 2018	Independent micro grids for rural electrification. Utilizing photovoltaic technology.
Products company utilizes/distributes	Solar Systems above 5kW

OGINNI EVER INCREASING ENT. NIG. LTD (OEIE)

Name of Key Contact Person	Debo Ladejola
Address	11, Aguleri Drive,Divine Homes, Thomas Estate, Lekki. Lagos
Email and Telephone Number	samladejola@gmail.com; 0803 335 4370
Capital Seeking	10,000,000 NGN (Equity)
Projects for 2018	1. 100KW mini grid in Elekokan, Oyo State 2. 100,000 liters solar powered water scheme for Plateau State 3. Solar Irrigation for Plateau State farmers
Products company utilizes/distributes	Solar Home Systems

PRIVIDA POWER LIMITED

Name of Key Contact Person	Chibuzor Nwosu
Address	7 TF Kuboye Street. Oniru, Lekki. Lagos
Email and Telephone Number	info@prividaenergy.com; 0803 555 2124
Capital Seeking	100,000,000 NGN (Equity); 400,000,000 NGN (Debt)
Projects for 2018	1. 500KW solar energy project for a major market in Abuja 2. 1.0MW residential estate projects in Abuja, Lagos and Port Harcourt 3. 1.0MW captive solar energy project for a shopping complex in Ogba, Lagos State 4. Deployment of BIPV solution for a residential estate in Abuja 5. Biomass plant for 3 rural areas in Nigeria 6. Roll-Out of Solar Home Systems (solar kits) in three local government areas in Kaduna
Products company utilizes/distributes	Solar home systems, BBOXX, 5KW to 20KW solar home systems, BIPV roofing tiles in real estate, Biomass, Wind energy, using atmospheric wind extractor (awe)

PROTEK POWER AND ENERGY LIMITED

Name of Key Contact Person	Akinjide Obe
Address	Plot T13 Ramat Crescent Ogudu, Ojota, Lagos State
Email and Telephone Number	akinjide.obe@protekng.com; info@protekng.com 0802 536 8671
Capital Seeking	360,000,000 NGN (Debt)
Projects for 2018	2MW PV Hybrid System with 2MWh Storage for a residential estate
Products company utilizes/distributes	Solar PV systems 5Kw to 20Kw, Solar heaters

QUINTAS RENEWABLE ENERGY SOLUTIONS LTD

Name of Key Contact Person	Dr. Omotayo Dairo
Address	133 Oyemekun Road, Akure. Ondo
Email and Telephone Number	tayo.dairo@quintasenergies.com; 0803 451 0340
Capital Seeking	175,000,000 (Equity), 150,000,000 (Debt)
Projects for 2018	1. Completion of 500Kw biomass/solar hybrid power plant at Ofosu, in Ondo State 2. 100Kw solar power plant in Ala, Ondo State
Products company utilizes/distributes	Biomas, Solar PV more than 5kW

RANA WORLD TECH SHOP LIMITED

Name of Key Contact Person	Dr. Tajudeen Sikiru
Address	Suites B 14 -B 15, J'S Innovation Plaza. Kaduna
Email and Telephone Number	thsikiru@ranaworldtech.com; 0706 560 1294
Capital Seeking	30,000,000 NGN (Equity) 100,000,000 NGN (Debt)
Projects for 2018	1. 150 kWp solar Mini grid system for rural agro-cash crops farmers in Kaduna State. 2. 200 kWp irrigation and integrated solar system for food preservation systems in rural communities and under-served areas of Kaduna.
Products company utilizes/distributes	Solar Systems above 5kW

ROSHAN GLOBAL SERVICES LIMITED

Name of Key Contact Person	Happy Amos
Address	Zhaipe -Diko Road, Near former Crusher. Diko. Niger State
Email and Telephone Number	happyamos@ymail.com; 0806 916 9129
Capital Seeking	5,000,000 NGN (Equity), 7,000,000 NGN (Debt)
Projects for 2018	Briquettes production
Products company utilizes/distributes	Energy efficient appliances

RUBITEC NIGERIA LIMITED

Name of Key Contact Person	Bolade Soremekun
Address	5, Talabi Street, Ikeja. Lagos
Email and Telephone Number	bolades@rubitecsolar.com; 0803 449 9670
Capital Seeking NGN	18,622,608 NGN (Equity) 79,000,000 NGN (Debt)
Projects for 2018	Solar mini-grid scale up with a combination of different but complementary energy generation systems based on renewable energies (bio-gas, wind, CSP, geothermal) or conventional energy (diesel generator). In our project, the percentage of renewable energy source will outweigh the conventional source. Other projects we seek financing for includes solar home systems, solar PV systems for offsite ATM machines, and solar irrigation & water pumping.
Products company utilizes/distributes	Solar Systems above 5kW

SOLARMATE ENGINEERING LIMITED

Name of Key Contact Person	Dotun Tokun
Address	67, Adisa Bashua Street, Surulere. Lagos
Email and Telephone Number	dotuntokun@solarmateng.com, 0803 401 6045
Capital Seeking	60% (Equity), 40% (Debt)
Projects for 2018	1. Solar home systems for 1,000 houses 2. PV-Diesel hybrid power packages totaling 2MWp
Products company utilizes/distributes	Solar Systems above 5kW

SOSAI RENEWABLE ENERGIES COMPANY

Name of Key Contact Person	Habiba Ali
Address	No 1a Yakubu Gowon Way, Kaduna
Email and Telephone Number	habiba@sosairen.org; 0803 311 0130
Capital Seeking (NGN)	200,000,000 NGN (Equity) 350,000,000 NGN (Debt)
Projects for 2018	To open up experience centers in 5 Northern States while deploying Solar Home Systems in rural communities and urban areas.
Products company utilizes/distributes	Solar Home Systems

VANPEUX GLOBAL SYNERGY LIMITED

Name of Key Contact Person	Ovoke Ekrebe
Address	15 Bajulaye Road, Shomolu, Lagos State
Email and Telephone Number	vanpeuxglobalsynergyltd@yahoo.com, ovoke.ekrebe@vanpeux.com 0905 390 2950, 0805 273 5910
Capital Seeking	900,000,000 NGN (Debt)
Projects for 2018	150kWp PV-Diesel Hybrid for Lagos Business School 15kWp and (160kWh of storage) of fully DC-based decentralized solar system, 40kWp Solar Street light service
Products company utilizes/distributes	Solar Home Systems, Solar PV systems above 5kW

Training Curriculum and Centers

PHOTO: © 2018 BOBBY NEPTUNE FOR WINROCK INTERNATIONAL

The Proprietor

As the owner of a small restaurant and hotel in Gbamu Gbamu, Olamide Olasunkanami has always relied on diesel and petrol generators to keep his guests happy. Comfort requires electricity to run the refrigerator that keeps drinks cool and to power the TV, radio, fans and air conditioner that ensures guests return again and again. But generators are expensive enough that Olasunkanami has to limit their use. "Normally, I run it from 6 pm to 12 am but today is a market day," he says as music blares from inside the hotel. "I know many people will be around so I run it around the clock." Olasunkanami won't have to make those choices about turning the generator off and on at certain times once the solar-powered mini grid is in operation. For the same amount of money he spends on diesel today, he'll be able to make electricity available to his guests all the time. "The drinks are going to get colder and people are going to enjoy the electricity because they can always watch the TV and use the fan," he says. "If there is power always, we can build another hotel."

To address a lack of technical standards and expertise in the RE/EE sector, REEEP and NESP partnered together to create seven training curricula, from PV installations to energy efficiency building design. Then, both programs supported 12 training academies and research institutes to deploy the training and market it to relevant firms. These trainings should lead to increased quality of RE projects in Nigeria and increased competition in the marketplace.

Besides certificates issued by training academies, REEEP and NESP are establishing a national certification system. Rather than certifying individual training centers, which would be costly and require more resources, Nigeria will use an independent third party certification body to conduct examinations. It is imperative that this body be independent as it will reduce conflicts of interest and ensure high quality standards.

GIZ's NESP II program will manage and support the third party body as it comes online. Please contact Sharon Kaburuk at GIZ with any questions: Sharon.Kaburuk@outlook.com.

Training Courses on Offer

SPVI
BAS • CU • IEA
ISSCeRER • NAPTIN
NCEEC • NCERD
SERC • TVC

Solar PV Installation (SPVI) – become a solar PV installer in 20 days; for electricians with informal training; 160 hours

SPVIS
BAS • CU • IEA
ISSCeRER • NAPTIN
NCEEC • NCERD
SERC • TVC

Solar PV Installation Supervisor (SPVIS) – become a solar PV supervisor in 30 days; for electricians with formal training; 240 hours

MGD
BAS • CU • IEA
ISSCeRER • NAPTIN
NCEEC • NCERD
SERC • TVC

Mini Grid Design (MGD) – become a mini grid designer in 35 days; for electrical engineers; 280 hours

RHPCE
CRET • GTDI
IEA • NAPTIN
NCEEC • SERC

Rural Hydropower Civil Engineering (RHPCE) – become a micro-hydro civil expert in 15 days; for civil engineers; 120 hours

EEBD
NIA • NAPTIN

Energy Efficient Building Design (EEBD) – become a building energy efficiency designer in 15 days; for building design professionals; 120 hours

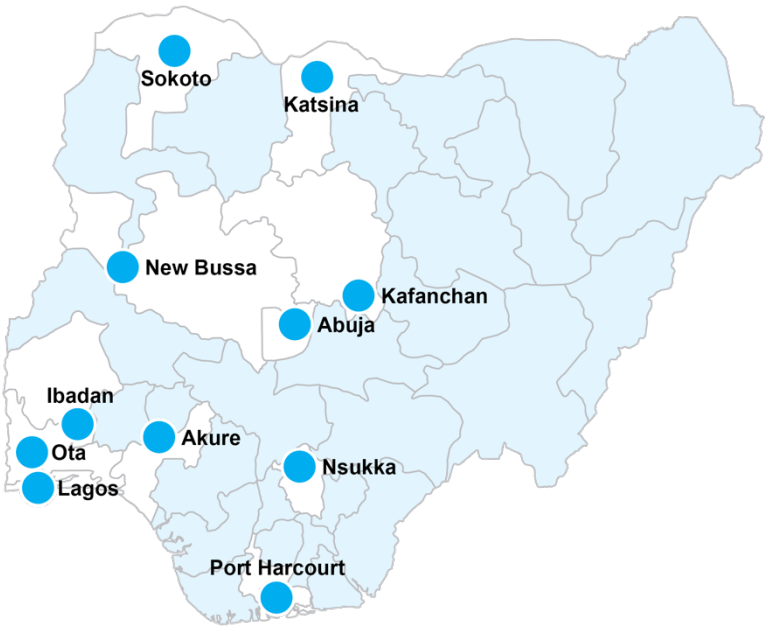
EM
BAS • CRET • CU
GTDI • ISSCeRER
NAPTIN • NCEEC
NCERD • SERC

Energy Management (EM) – become an energy manager in 20 days; for facilities managers; 160 hours

EA
BAS • CRET • CU
GTDI • ISSCeRER
NAPTIN • NCEEC
NCERD • SERC

Energy Audit (EA) – become an energy auditor in 25 days; for engineers; 200 hours

Find a Training Centre Near You



BAS Associates Consulting
5 Talabi Street, off Adeniyi Jones Avenue, Ikeji, Lagos
080 3449 9670/080 2319 3757
b.soremekun@basconsultingltd.com

Centre for Renewable Energy Technology (CRET)
Federal University of Technology Akure, Akure
081 0802 1248
olafe@futa.edu.ng

Covenant University (CU)
Department of Electrical and Information Engineering, Idiroko Road, Ota
080 9778 0049
victor.matthew@covenantuniversity.edu.ng

Green Technology Development Institute (GTDI)
University of Ibadan, Ibadan
080 3539 4293
adeboyeolatunbosun@gmail.com

Ibrahim Shehu Shema Centre for Renewable Energy Research (ISSCeRER)
Umaru Musa Yar'adua University, Dutsin-ma Road, Katsina
090 5383 9499
CeRER@umyu.edu.ng

International Energy and Technical Polytechnic (IETP)
Ankpong Nandu, Gwantu nr. Kafanchan, Kaduna State
081 1270 6137
info@InternationalEnergyAcademy.org

National Centre for Energy Efficiency and Conservation (NCEEC)
Systems Engineering Building (Old Wing), University of Lagos, Akoka Campus, Lagos
080 2330 4426
info@NCEEC.org.ng /
AJ.Kehinde@nceec.org.ng

National Centre for Energy Research and Development (NCERD)
University of Nigeria, Nsukka
080 6570 2570
PEUgwuoke@gmail.com

National Power Training Institute of Nigeria (NAPTIN)
RTC Ijora, beside Old Power Station, Lagos
RTC Kainji, Kainji Hydro Station, New Bussa
070 6777 7559 / 080 3764 9669
OresLek@gmail.com

Sokoto Energy Research Centre (SERC)
Usmanu Danfodiyo University, Sokoto
080 2208 3614 / 080 3606 4359
SMDd767@yahoo.com / SMDd767@gmail.com

Technical and Vocational Training Centre (TVC)
Ohia Street, Rumuigbo Street, Port Harcourt
070 6362 2973
info@PHTVC@zwh.de

The Nigerian Institute of Architects (NIA)
24 Magaji Muazu Cresent, Katampe Extension, Abuja
080 3713 6808 / 080 3326 1959 / 080 6567 0714
NIA.EEBD.RE@gmail.com

Our Partners

PHOTO: BASINU, ONE OF ISSA'S FARMHANDS, CARRIES A SACK OF COCOA BEANS. © 2018 BOBBY NEPTUNE FOR WINROCK INTERNATIONAL

The Cocoa Farmer

Like many of his fellow villagers, Alimi Issa first came to Gbamu Gbamu to be a cocoa farmer. Through his years as both a farmer and as an aggregator who buys cocoa beans from other local growers, Issa has learned that weather and the seasons play a big role in his success. On clear and warm days, for instance, he can rely on the sun to dry his beans while the rainy season brings the risk that they'll spoil. But the uncertainty and risk that he's faced for years will disappear with the arrival of the solar-powered mini grid in Gbamu Gbamu. Why? Because Issa plans to buy a machine that dries the cocoa beans, allowing him to both dry his own crops and charge other farmers to dry theirs. "I don't need to wait for the sun to come out," says Issa, who sells his beans to the agribusiness Olam, which ships them to Switzerland to be made into chocolate. "I buy the newer drying machine and farmers will carry their cocoa to me and I make extra money."

We'd like to thank our institutional partners, who provide an array of services to the sector and will carry REEEP's achievements forward. We encourage all of the stakeholders in this sector to work together to achieve more.

USAID
FROM THE AMERICAN PEOPLE

POWER AFRICA

WINROCK INTERNATIONAL