

Overview: USADF currently manages a portfolio of 39 projects in 6 countries under the Power Africa Off-Grid Energy Challenge. Total commitment is \$3.9 million following Rounds I and II.

More at: <http://www.usadf.gov/USADFOffGridChallenge.html>

Off-Grid Energy Projects

INVESTMENT SUMMARY



Country	Grantee	Year	Value	Summary
E T H I O P I A	Ethio Resource Group	2014	\$100,000	Wind: Ethio Resource Group is an Ethiopian-owned and managed renewable energy company which is establishing six small wind-powered micro-grids in the rural highland area of Menz Gera Midir Woreda, Amhara Region. This area has very limited infrastructure, and in the proposed project area, zero households or businesses have electricity access. The wind-powered micro-grids will take the place of traditional forms of energy such as kerosene and dry cell batteries. Ethio Resource Group will own and manage the facility as a distributed energy service company, one of the first of its kind in Ethiopia.
	Organization for Rehabilitation and Development in Amhara (ORDA)	2014	\$100,000	Biogas: ORDA is a Ethiopian not-for-profit organization which is building and installing 470 household biogas digester plants in the rural area of Alefa District, Amhara Region. Households use the biogas plants to generate their own gas for cooking and lighting, taking the place of traditional wood burning stoves which pose serious health risks to women and children who are chronically exposed to high levels of smoke on a daily basis and must travel to collect firewood for fuel. The use of biogas can also reduce pressure on the region's forest resources. ORDA is training 470 married couples on the proper operation and maintenance of biogas systems, and has also established the first five biogas user-cooperatives in the region.
	Sun Transfer Tech	2014	\$100,000	Solar: Sun Transfer Tech is an Ethiopian-owned private limited company focused on importing and distributing solar products. The company is distributing and selling 338 home solar systems to rural households in Wolkite, Southern Nations, Nationalities and People's Region, where the population is totally un-electrified and far from the grid. The company empowers small solar entrepreneurs to sell, install, and provide after-sales service for the systems. Their systems range in size between 20, 50 and 100 watt capacity and can power a variety of appliances including light bulbs, radios, and chargers.
	GM Clean Energy	2015	\$100,000	Biogas: GM Clean Energy is a start-up company working to develop Ethiopia's first successful biogas-powered stove to bake injera, a major food staple consumed daily in Ethiopia. Many rural households use firewood as a source of energy to cook injera, which takes a large toll on the local environment and is time consuming for individuals who have to collect the fuel wood. GM has developed a stove prototype and is in the cost of manufacturing and assembling them in Ethiopia. USADF funded GM to acquire equipment to expand their manufacturing capacity, establish a satellite workshop, and produce their first batch of stoves for market trials in the community.

Country	Grantee	Year	Value	Summary
G H A N A	NewEnergy	2014	\$100,000	Solar: NewEnergy is a Ghanaian NGO with almost 20 years of experience providing water, sanitation and energy services to underserved communities across Ghana. In Nabogo access to basic water and electricity services is less than 30%. It is difficult to treat and transport water to the areas where it is needed as the majority of the country's rural population does not have grid access and when available, the grid electricity supply is unreliable. New Energy tackles this problem by utilizing solar-powered water pumping and purification technology to supply clean water to over 980 inhabitants of Nabogo. The project will be run as a social enterprise, in which a community-owned cooperative takes over the operation and management after sufficient training has been provided.
	Solar Light	2014	\$100,000	Solar: Ghana's informal street vendors often work for less than \$3 a day for long hours in the sun. They are critical to the mobile phone economy by selling the vast majority of phone companies' prepaid "recharge cards," yet the income from phone recharge cards alone is often not enough to sustain a household. Solar Light Company is addressing the problem by prototyping and piloting its "Sunana" solar powered mobile charging system in Accra, Sunyani and Dawhenya. The Sunana unit consists of a solar panel divided into eight segments which can be "worn" on top of a trader's umbrella, and comes with components for charging mobile phones, attaching LED lights, and storing cash. Solar Light Company will build an initial set of prototypes and then deploy the finalized models onto the market, assessing their viability.
	The Kumasi Institute of Tropical Agriculture (KITA)	2015	\$100,000	Biogas: KITA is a Ghanaian NGO which serves as a leading center for research, technology transfer and education in farming, agriculture, agribusiness, and environmental resources management. The community of Papisisi is located in the Offinso North District of Ghana and has a large local industry that produces palm oil and palm kernel oil. The town has no grid access to electricity and, as a result, cannot use electrical machinery for processing its agricultural products. Instead, it uses traditional, energy-inefficient systems for agricultural processes such as cracking and milling, which can take up to 30 hours and consume more than 40 hours of labor. As an alternative, residents travel several kilometers to the nearest town with available electricity. KITA is procuring and installing a 20 kilowatt gasifier plant which can convert the town's biomass and agricultural residue into electricity. In addition, KITA will procure processing equipment, including a palm kernel cracker, expeller, and oil squeezer that will operate on the electricity produced and allow the community to process its agricultural products more quickly.
	KW Ventures	2015	\$100,000	Solar: Dunkwah-Obenkrom is a community located in the Ashanti Region in southern Ghana. Obenkrom is about ten miles off the Kumasi Dunkwah road. The community has no access to electricity and members use kerosene lanterns and candles for their lighting needs. There is a local elementary school and a health clinic in the community. K.W. Ventures will provide clean, affordable electricity to the community through the purchase and installation of two 1.7 kilowatt mobile solar trailers with 100 portable battery packs. The portable battery packs are recharged by the solar trailers and are equipped with two LED lights, a USB port for cell phone charging, and a flashlight. A solar trailer can also be attached directly to a community institution, such as the village school or health clinic, to meet its daily electricity needs.

Country	Grantee	Year	Value	Summary
G H A N A	Wilkins Engineering Limited	2015	\$100,000	Solar: Atigagome is a remote island community on Lake Volta located in the Sene District of the Brong Ahafo region of Ghana. Fishing represents the main source of income for 80 percent of the community's inhabitants, and the lack of electricity leaves them with no means of storing or cooling their perishable food products. In addition to the lack of cooling equipment, the community relies heavily on dry cell batteries, kerosene, and candles for its lighting needs. Wilkins Engineering will install 200-watt and 300-watt solar home systems that include TVs, four to seven lighting points, and mobile phone charging capability. In addition, Wilkins will build a small cold storage facility for fishermen to store their perishable food products and will install solar streetlights for a main road in the community.

Country	Grantee	Year	Value	Summary
KENYA	Boma Safi Limited	2014	\$100,000	Solar: Boma Safi Limited is a Kenyan company founded to support distribution of renewable energy and energy efficient products to bottom of the pyramid consumers. Boma Safi has faced challenges distributing efficient energy technologies to their customers due to their limited buying power. Many households in rural areas are disbursed geographically, increasing transportation costs to reach them. USADF funded Boma Safi to address this problem by utilizing a “hub and spoke” model, in which rural energy hubs aggregate deliveries between the point of sale (typically rural savings and credit cooperatives), and central hubs. This method will be used to distribute solar lanterns to customers in five regions: Coastal, Lake Victoria, North Rift, South Rift, and Mount Kenya.
	Kitui Industries Limited	2014	\$100,000	Bio-diesel: Kitui Industries Limited is involved in cotton farming and processing in eastern Kenya, and has recently begun additional processing of cottonseed oil produced into bio-diesel. The organization has invested in a bio-diesel plant that produces bio-diesel which it uses to power its factory and vehicles. This project will expand the existing bio-diesel production plant and expand access to modern mechanical production methods for its farmers through multi-purpose diesel engines and subsidized diesel fuel. Kitui will produce and sell bio-diesel from cottonseed, and also sell multi-purpose diesel engines to farmers groups via a local MFI, which can be used to power small-scale agricultural processing. USADF funded Kitui to expand its bio-diesel production capacity and purchase the initial batch of low-speed engines.
	Pfoofy Power and Light Limited	2014	\$100,000	Solar: Pfoofy Power and Light Limited is a Kenyan renewable energy company focused on transport solutions. The company previously developed a pilot service station which uses solar photovoltaic panels to power electric motorcycles for rural transport. USADF funded Pfoofy Power and Light to further address the local transportation issues by expanding this pilot installation, establishing two 10-kilowatt solar charging stations for over 40 electric motorcycles. Pfoofy trains drivers in the operation of electric motorcycles as well as customer service and driver’s safety. Pfoofy offers drivers daily unlimited battery swapping for drivers at a much lower rate than they currently spend on fuel.
	SCODE Limited	2014	\$100,000	Solar/biogas: SCODE Limited is a Kenyan-owned social enterprise in the Rift Valley region of Kenya. For SCODE’s customers in Nakuru, Uasin Gishu, Embu and Meru counties, as in many other parts of Kenya, the key barrier to access to efficient cooking and lighting technologies is often the high upfront cost of grid connections or outright ownership of a solar home system. SCODE addresses this problem through the project by using a pay-as-you-go system for pre-financing 75-85% of the total costs of its products to its clients, with repayment periods of 12 months on average. SCODE manufactures its own high-efficiency forced-draft micro-gasifier stoves, and combines them with solar home systems assembled at their Nakuru workshop to give customers access to lighting, charging, and small appliances.

Country	Grantee	Year	Value	Summary
KENYA (cont'd)	Sollatek Kenya Limited	2014	\$100,000	Sollatek Kenya Limited is a Kenyan electronics company with offices in Mombasa and Nairobi. They have completed a variety of solar projects all over East Africa with partners including NGOs and international corporations. Sollatek addresses the constraints local coastal fishermen are facing by working with already-existing Beach Management Units (BMU) to create and run solar centers to power freezers, phone charging stations, and portable solar lantern rentals. USADF funded Sollatek to identify 15 BMUs which meet eligibility criteria, including financial stability and local capacity, and train them on business management, bookkeeping, and solar product sales. Sollatek will install 15 solar charging centers in these rural communities and transition the ownership and management of the systems to the BMUs.
	Rafode Limited	2015	\$100,000	Rafode Limited is a Kenyan microfinance organization which has developed a revolving loan product for fishermen and fish vendors to purchase solar lamps and fuel-efficient cookstoves in rural Homabay County, western Kenya. USADF has funded Rafode to expand this revolving loan fund to reach at least 1,000 fisherman and vendors who currently do not have access to the grid. Many fisherman use expensive kerosene lamps to fish at night, cutting their earnings in half each day. This technology will enable the fishermen to use efficient, effective, safe and affordable solar powered lights for fishing. Rafode will also establish a new branch office in the area and carry out outreach and community sensitization to familiarize users with the loan product.
	Ambalian Limited	2015	\$100,000	Ambalian Company Limited is a Kenyan renewable energy company which is developing the technology to locally assemble wind turbine components in Kenya, reducing the costs of water pumping in Kenya's semi-arid regions. In the rural pastoralist region of Bubisa, northern Kenya, Ambalian will replace diesel-powered generators currently being used to power water pumping with a wind turbine system. Ambalian will then locally fabricate three local content components (blades, lattice structures and controllers) for the wind system. Once fully tested, Ambalian will be able to use their own locally produced components for wind system installations as well as sell the components to other organizations installing wind systems.



Country	Grantee	Year	Value	Summary
L I B E R I A	Alternative Energy Inc.	2014	\$100,000	Solar: Alternative Energy Inc. is a Liberian-owned business registered in 2004 which specializes in the design/installation of renewable solar energy. Galama Town is an isolated rural area in Lofa County, in the far northwest corner of Liberia, close to the Guinea border and approximately 375 kilometers from Monrovia. The population is estimated at 2,750, none of whom have access to basic energy services. There is no public energy supply and the government and rural electrification authority have no plans to expand their services there. The villagers depend on towns at least 25 miles away to purchase kerosene for homemade lamps and dry cell batteries. The project addresses the current challenges by installing mini off-grid solar systems for 90 households, 5 classrooms in 1 school, 1 clinic/drugstore, 11 shops, and 5 streetlights. Usage fees will be charged to households and shops and at a subsidized rate to the school and clinic.
	Ecovillage Community Improvement Association, Inc.	2014	\$100,000	Solar: Ecovillage Community Improvement Association, Inc. has been created to represent the interests of homeowners and residents of Ecovillage Schieffelin residential community with 80% of the shares reserved for future homeowners. This project will deploy a 50 kW off-grid solar mini-grid. The system will include DC to AC inverters and a distribution network including direct connections for households and businesses within 1 kilometer radius, and 2 small kiosks for affordable pay-as-you-go battery charging for cell-phones and LED household lighting fixtures. Businesses and households with a direct connection will pay a small monthly fee. In addition, discounted power will be provided for schools and security lighting.
	Liberia Engineering and Geo-Tech Consultants Company	2014	\$100,000	Solar: Liberia Engineering and Geo-Tech Consultants Company is a Liberian owned company comprising of a group of trained Liberian general construction engineers, architects and electricians. Liberia Engineering & Geo-Tech Consultants Company is currently providing electricity at a small scale to 13 households using a fuel based generator in the town of Totota, central Bong County. This project expands these activities by constructing a stand-alone PV 25 KW solar plant to serve 50 households through a mini grid. Households will pay a small monthly fee based on metered usage of electricity.



Country	Grantee	Year	Value	Summary
N I G E R I A	Ginphed Nigeria Limited	2014	\$100,000	Biogas: Ginphed Nigeria Limited is a private company incorporated in 2003. In the region near Ginphed Farm in Cross River State, the majority of inhabitants base their livelihoods on production of agricultural products, which require processing prior to sale or else significant amounts are lost to post-harvest spoilage. Many farmers rely on cottage industry processing for their farm produce, but electricity from the national grid is unreliable and much processing is fueled either by firewood or by expensive diesel-powered generators, which cuts significantly into profit margins. Ginphed is addressing these issues by constructing a bio-digester to convert animal manure into biogas to be used for electricity generation, which would be sold to farms and agro-processing cottage industries in the surrounding communities.
	Quintas Renewable Energy Solutions	2014	\$100,000	Biomass: Quintas Renewable Energy Solutions is a Nigerian-owned limited liability company which specializes in technology development including solar and biomass generation and farm-gate industrial cluster development. The community of Ofosu, located in Ondo State, does not have access to grid electricity, but has a strong local farming industry. Currently, agricultural products are mainly processed using manual processing methods which are taxing for farmers and inefficient. If farmers are able to process more of their agricultural and forest produce beyond the primary raw material stage before sales, they will be able to enhance their income. Quintas is addressing these constraints by developing a 500 kilowatt biomass power plant which will take advantage of the community's agricultural and forestry residue, including sawdust from the four sawmills in the area, which have an abundance of sawdust and currently rely on expensive diesel to power their mills. The power plant will include a steam turbine, generator, and gasifier with combustor. The electricity will be paid for through pre-paid meters.
	Sky Resources	2014	\$100,000	Solar: Sky Resources is a Nigerian-owned private company focused on promoting renewable energy technologies. Nawgu, a community in Anambra State, is one of thousands of villages in Nigeria with no grid access to electricity and grid extension is unlikely for some time. The village has a small but thriving small and medium enterprise community which currently relies on costly and unreliable diesel for much of its energy needs, which significantly increases enterprise operating costs. Sky Resources is addressing these constraints by developing a small solar micro-grid for which users will pay on a per-use basis. They will be supplying electricity for up to 75 small and micro businesses.
	Topstep Nigeria	2014	\$100,000	Solar: Topstep Nigeria is an energy solutions provider with a focus on renewable energy and energy conservation. Babban Gona Agricultural Franchise is a 2,000 member strong farmer cooperative located in the Makarfi and Ikara Local Government Areas of Kaduna State. In order for the member farmers to increase their income, they need to increase market value of their produce by adding value to their produce through post-harvest processing. Currently, they do not have access to reliable electricity. Topstep successfully installed and operated a solar maize mill in 2012, but it is severely undersized to current demand. Topstep is addressing this constraint by expanding the current solar maize mill processing station that has been previously installed. The project is expanding the existing processing capacity to 1,400 metric tons of maize per year by installing 5 processing stations located near the farmer's fields. Each station will have 3 high quality milling machines powered by solar energy as well as portable batteries charged and available for farmers to use at their homes for a fee.

Country	Grantee	Year	Value	Summary
N I G E R I A	Ajima Farms and General Enterprises Nigeria Limited	2015	\$100,000	Biogas: Ajima Farms has been in operation since 2003 and focuses primarily in sales of poultry, catfish and cassava. Kuji and Rije are two neighboring communities that are roughly ten kilometers from Kuje Town in the Abuja Federal Capital Territory. The two villages have approximately 150 households or 1,500 people, 98 percent of whom are farmers. The community members currently are 100 percent off the national energy grid and rely on kerosene, with a few members traveling to Kuje town to purchase kerosene and diesel for energy. Ajima Farms is addressing the communities' energy needs in the construction of a biogas plant that will convert poultry, livestock, and other waste into biogas. Poultry waste will be sourced from Ajima Farms and from other surrounding poultry farms and transported to the Project site. The biogas will fuel a biogas generator that will produce electricity for a mini-grid connected to households and small businesses. The biogas will also be available for use with biogas compatible burners/stoves and biogas compatible lamps.
	Kunak Community Healthcare Foundation	2015	\$100,000	Solar: Kunak has been in operation since 2008 and has operated in community development in Kaduna state. The current buildings in Yakowa market have no reliable refrigeration units or product storage areas for meat and fish. Perishable goods are kept in unrefrigerated, open-air locations during the day and in unsanitary conditions at night. Diesel generators are sometimes used for electricity, but the electricity is unreliable and the fumes are detrimental to the health of the market vendors and customers. Kunak is developing a solar photovoltaic (PV) system as a way to provide clean refrigeration and storage for the Yakowa market vendors. In partnership with TerraWorks Contractors, SMA Solar, and Anjeed Engineering and Construction, Kunak will construct a meat and fish market building, which will be powered by a 7.5 kilowatt solar PV system to power lights, fans, and refrigeration equipment for the local vendors.



Country	Grantee	Year	Value	Summary
T A N Z A N I A	Jamii Power Limited	2014	\$100,000	Jamii Power Limited is a private company registered in Tanzania in 2012. USADF has funded Jamii to expand its existing 11-kilowatt solar mini-grid in remote northern Tanzania to 33 kilowatts, and also to field-test and deploy a new smart meter prototype, which will give mini-grid operators the capacity to remotely monitor current, limit loads, cluster metering, and detect non-technical losses.
	L's Solution Limited	2014	\$100,000	L's Solution Limited is a Tanzanian-owned social enterprise based in Arusha. USADF funded L's Solution to build a solar PV powered mini-grid that will provide first time access to electricity to residents in rural Samunge village, which falls within the border of Ngorongoro National Park and is about 60 km from the national grid. L's Solution will install and operate a 12-kilowatt solar PV power plant that will supply electricity to over 120 households, businesses, health centers, and schools.
	Lung'ali Natural Resources Company (LNRC) Limited	2014	\$100,000	LNRC is a Tanzanian company currently developing the Maguta - Small Hydro Electricity Power Project (SHEPP). The purpose of the USADF grant is to support LNRC to provide households in off-grid village communities with first-time access to modern electricity services. LNRC has already developed a 2.4 MW dam project intended to serve up to 16 villages in Kilolo administrative district. However, many households cannot afford the connection fees of up to USD 500 to connect to the distribution network. USADF has funded LNRC to establish a revolving credit facility for households to pay a small upfront connection fee, and then repay the loan in quarterly installments over time.
	Space Engineering	2014	\$100,000	Space Engineering is a private Tanzanian company that has established some of the first biomass gasification plants in the country. The project area is the remote village of Hamwelo, Mbozi district, in Mbeya, a community of over 500 households without access to national grid electricity. The community currently uses 3-5 diesel generators to run machines for maize milling and coffee deshelling. USADF funded Space Engineering to develop a 40 kW hybrid solar-biomass power plant, to use a combination of biomass gasification (rice husks and maize cobs) and solar to power the community 24 hours a day. This electricity will then be distributed through a mini-grid to households, schools, a health center, and local businesses.

Country	Grantee	Year	Value	Summary
T A N Z A N I A	Benedictine Sisters of St. Gertrud Convent Imiliwaha	2015	\$100,000	The Benedictine Sisters of St. Gertrud Convent, Imilwaha, have developed a 317 kilowatt small hydroelectric power plant project, based on their experience running a similar power plant for the past three decades. The hydroelectric plant will allow rural households to access low-cost, sustainable electricity for the first time. However, many households cannot afford the connection fees of up to USD 500 to connect to the distribution network. USADF has funded the creation of a revolving credit facility for households to pay a small upfront connection fee, and then repay the loan in quarterly installments over time.
	SESCOM Kibindu Biomass Micro-Grid Project	2015	\$100,000	SESCOM is a Tanzanian renewable energy company installing a 20 kilowatt micro-grid powered by biomass (primarily maize cobs) in rural Kibindu village in eastern Tanzania. By replacing diesel and kerosene energy with access to a biomass gasifier-based grid, households that currently spend 30% of their monthly income on lighting will experience significant cost savings that can be used to improve livelihoods and reduce poverty. USADF has funded SESCO to procure materials and equipment for installation, smart meters, and trainings for operations of the 20 kW micro-grid.
	Maasai Pastoralist Solar School Micro-Grid Project	2015	\$100,000	MPDO is a Tanzanian non-profit organization which will install solar PV systems at seven Maasai schools in rural northern Tanzania, providing reliable electricity to students, teachers, and the surrounding community. They will establish an off-grid energy credit fund in the community for further expansion in areas where population density is low and reaching pastoralist communities is difficult. USADF has funded MPDO to install solar PV systems at seven schools in rural northern Tanzania and to establish an off-grid energy credit fund for future expansion.
	Watumia Umeme Cooperative Society Masimbwe Micro-Grid Project	2015		WUCS is a grassroots Tanzanian cooperative owned and managed by electricity users in rural Masimbwe, a remote village in southwestern Tanzania with no access to the national grid. WUCS is working with a technical partner to install a 10-kilowatt solar micro-grid in Masimbwe. This will provide households with solar power and replace kerosene and firewood as primary fuel sources. USADF has funded the cooperative to create a solar micro-grid for thirty houses and one micro-enterprise, to be run by the cooperative.