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KENYA

OFF-GRID SOLAR ENERGY MARKET KENYA

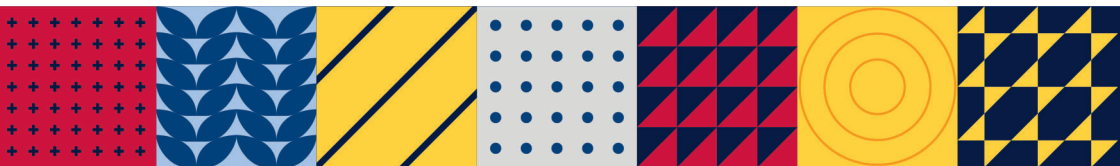
Summary Version of the 2019 Power Africa Off-grid Solar Market Assessment Report

Full report available online at: [usaid.gov/powerafrica/beyondthegrid](https://www.usaid.gov/powerafrica/beyondthegrid)



INVESTMENT OPPORTUNITIES

- Kenya's economy is the largest in East Africa, with a gross domestic product (GDP) of \$85 billion that is anticipated to grow annually by more than 5% over the next five years. **Kenya aspires to achieve middle-income country status by 2030 by focusing on healthcare, housing, food security and manufacturing, all of which depend on adequate, affordable, and reliable electricity.**
- Agriculture dominates Kenya's economy, employing 61% of the labor force. The country's top exports include tea and cut flowers, followed by coffee, legumes, and tropical fruits. **The sector faces challenges in irrigation, processing, and supply chain wastage that solar water pumps and cold storage could help alleviate.**
- Kenya was an early adopter of mobile money systems and remains a global leader in its use with more than 54 million open mobile money accounts. **More than 50 different lending apps are available over mobile money systems, making credit for purchasing solar products fairly accessible to many Kenyans.**
- Mini-grids supply electricity to many of Kenya's population centers that are isolated from the grid, and more than 23 grids have also been developed privately. **Recent legislation (Energy Act 2019) and forthcoming regulation are expected to alleviate uncertainty in the market, setting the sector up for accelerated growth in the future.**



ON-GRID AND OFF-GRID ELECTRIFICATION

Actual access rate vs. electrification target



Main provider of electricity. The Kenya Electricity Generating Company is responsible for power generation, the Kenya Transmission Company operates the transmission network, and the Kenya Power and Lighting Company distributes and sells electricity to the end consumer. Private mini-grids also provide electricity.



Plan to increase electricity access. The Kenya National Electrification Strategy (KNES) sets a current goal to achieve universal electrification by 2022 and appears to be on track to achieve 80–90% electrification in that timeframe. Kenya had the world's third fastest rate of electrification and the fastest rate in Africa in 2019. In addition to grid expansion, the KNES articulates plans to meet the energy demands of two million households with solar home systems and mini-grids.



Constraints to rural electrical grid extension. Rural, low-income areas of Kenya remain challenging to electrify. Even in communities within grid service areas, few households are able and willing to pay the connection fee of \$148 (15,000 in Kenyan Shillings), which may present an opportunity for less expensive solar home systems. Forty-seven percent of rural Kenyans remain unconnected to any electricity source.

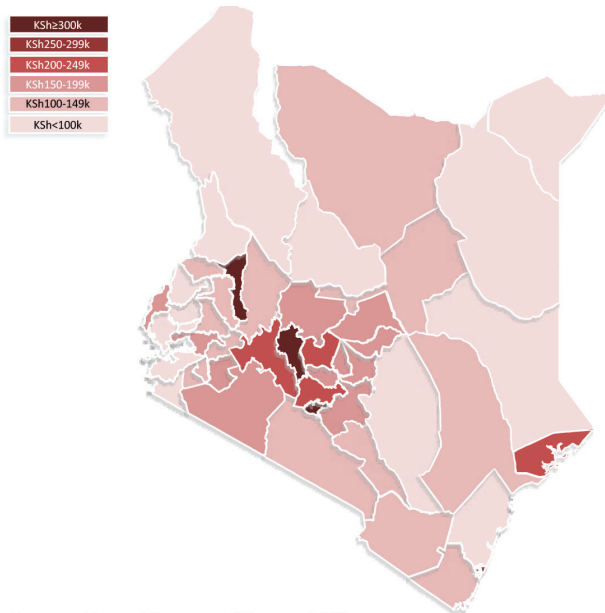


Policy and regulation. The Ministry of Energy develops policy and regulation, which the Energy and Petroleum Regulatory Authority (EPRA) implements. The 2019 Energy Act outlines obligations of national and county governments for the provision of affordable energy and establishes entities that regulate energy issues. New mini-grid regulations drafted in 2019 are expected to be formalized in the near future. The Finance Act of 2018 outlines the taxation and regulation of solar and wind equipment, and the Data Protection Bill of 2018 may have implications for off-grid energy companies transferring data outside of Kenya.



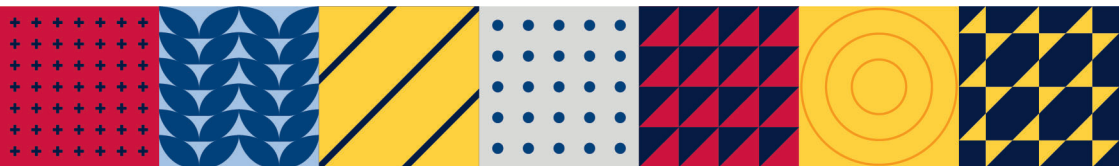
Associations. The Kenya Renewable Energy Association (KERE) is an independent nonprofit association dedicated to developing renewable energy businesses in Kenya, with 31 member organizations from the private sector, NGOs, government agencies, and donor groups. KERE promotes its members' interests, provides a platform for exchanging information about the renewable energy sector, and is also a member of the Kenya Private Sector Association (KEPSA). There is also a chapter of the African Mini-Grid Developers Association in Kenya.

Per capita gross county product, Kenya, 2013-2017



Source: Kenya Ministry of Energy 2019

KEY STATISTICS	
GDP	\$85 billion
GDP growth potential	5.6% over 5 years
Population size	51.4 million
Population density	90 people per km²
Population growth rate	2.3%
Household size	3.6
Rate of urbanization	4.23% (2015-2020)
Urban Rural population	Urban: 27% Rural: 63%
Languages	Swahili, English, numerous indigenous



SHS AND PICO-SOLAR

Kenya is the market leader in SHS sales in Africa, thanks to a favorable regulatory environment, government support, and the successful expansion of PAYGO and other consumer financing. Since July 2014, customers in Kenya have bought more than five million units of off-grid solar products. Companies active in Kenya include Azuri, Barefoot Power, BBOX, Bidhaa Sasa, BioLite, Bright, d.light, Fosera, Givewatts, Greenlight Planet, Mibawa, M-Kopa, Mobisol, Mwezi Energy, Orb Energy, Pawame, Solar Kiosk, Solar Panda, Solinc, Sollatek, and Spark Possibilities. Considerable opportunities exist for expansion of the sector. Even late entrants, such as Solar Panda, have found success, indicating that the market is not yet saturated. Achieving universal access by 2022 will require an additional 2.2 million SHS and 38,000 mini-grid connections.

Consumer Finance. PAYGO is the most popular way for Kenyans to finance their purchases of solar off-grid products. Microfinance institutions (MFIs) in Kenya provide some consumer financing for SHS, but companies rely on them less than PAYGO for several reasons. Companies using PAYGO are more likely than MFIs to lend to unbanked customers and will lend smaller amounts than most MFIs. The widespread availability of mobile money facilitates the use of PAYGO in Kenya as well.

Commercial Finance. Off-grid companies operating in Kenya attracted substantial equity investments during the early stages of the market, but investment flows have slowed because existing investors have not yet exited their original investments, which makes it difficult to recycle capital into the market. Additionally, some investors are reluctant to invest in new companies that may cannibalize market share from their existing investments. As such, all off-grid companies—even the largest, most stable companies—are still raising equity capital. Grant funding has also slowed due to the perception that the Kenyan market is mature, even though some segments of the market are still struggling to establish sustainable business models (e.g. last-mile distribution in northern Kenya).

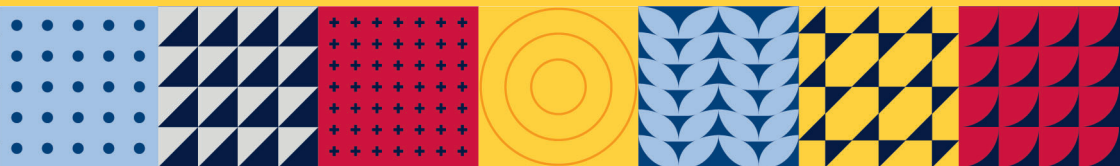
Productive Use. There are a variety of productive-use applications for off-grid solar in Kenya, mostly centering around agriculture. Water pumps help prevent irrigation issues, cold storage help prevent supply chain wastage, and solar fishing lights help locals fish after dark. The productive-use sector is less mature than mini-grids and SHS and presents a clear opportunity for commercial investment and social impact in rural populations.

MINI-GRID

Kenya was an early adopter of the recent wave of privately developed mini-grids. In addition to Kenya's already existing public mini-grids, it has more than 23 private mini-grids fully developed and 133 in various stages of development. Kenya has been refining its mini-grid regulations and has been planning to expand tender-based opportunities for new mini-grid development.

Regulation. In 2019, the Government of Kenya drafted mini-grid regulations, which it has yet to enact. The EPRA is expected to publish them for public comment before developing a final draft to send to the Minister of Energy and Parliament. The regulations are expected to be adopted in the near future following the enactment of the 2019 Energy Act.

Financing. Financing is expected to pick up after regulatory certainty improves. Two mini-grid companies have already attracted large equity investments (Powerhive with \$32 million and PowerGen Renewable Energy with \$4.5 million), demonstrating the sector's potential even with relatively few systems deployed.

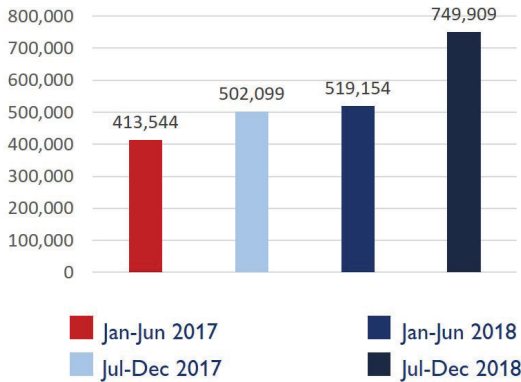


MARKET INTELLIGENCE USING GOGLA DATA

Sales and investment data from the Global Off-Grid Lighting Association (GOGLA) provide details about the off-grid solar sector. Pico-solar sales fell in the first half of 2017 but grew to 600,000 units in the second half of 2018. SHS sales are lower but steadily growing, reaching more than 100,000 units sold in the second half of 2018.

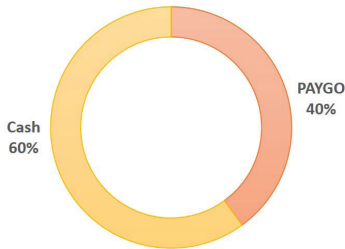
Sales of pico/SHS units

Jan 2017 - Dec 2018

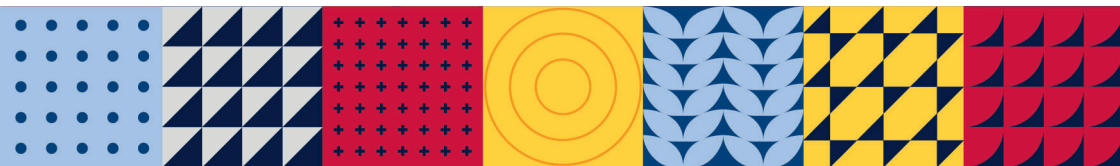


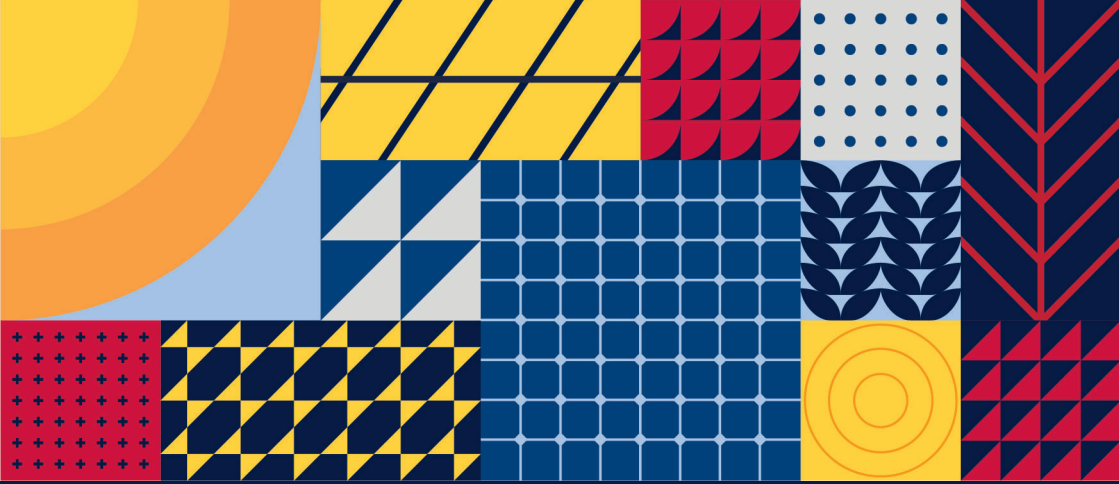
Sales by business model

Jul-Dec 2018



In 2018, customers paid for most solar products sold by GOGLA associates in Kenya through a pay-as-you-go (PAYGO) financing model. Customers only paid for \$18 million of the \$112 million in sales in cash, although many companies report stronger cash sales in less developed regions. This indicates that many consumers will need to pay down solar assets over time, and additional funding to the solar off-grid sector may allow for continued expansion of PAYGO and the off-grid solar market.





Power Africa aims to achieve 30,000 megawatts of new generated power, create 60 million new electrical connections, and reach 300 million Africans by 2030.



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