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GHANA

OFF-GRID SOLAR ENERGY MARKET GHANA

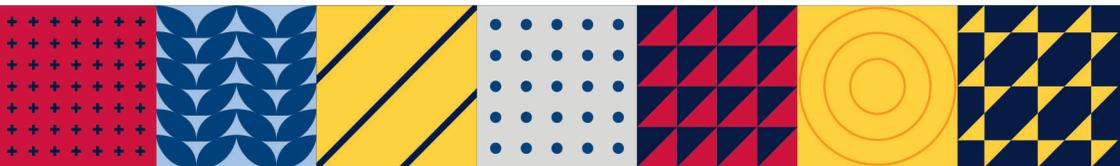
Summary Version of the 2019 Power Africa Off-grid Solar Market Assessment Report

Full report available online at: usaid.gov/powerafrica/beyondthegrid



INVESTMENT OPPORTUNITIES

- In 2018, Gross Domestic Product (GDP) was \$65.56 billion, which is anticipated to grow at an average of 6.7% per year. **Ghana boasts the second highest electrification rate in sub-Saharan Africa and ranks sixth in the region on the World Bank Group's Doing Business assessment for electrification, showing the market has been open.**
- Agriculture accounts for 69% of Ghana's land area and about 40% of employment. **The Renewable Energy Master Plan (REMP) set targets for 6,000 solar irrigation systems (\$30 million investment) and 80 solar crop dryers (\$160 thousand investment) to be deployed by 2020.**
- Ghana is the fastest growing market for mobile money in Africa with \$44.4 billion in transactions in 2018. From 2017 to 2018, active mobile money agents increased by 19%; mobile money wallets by 17%; and the volume and value of transactions grew by 48% and 43%, respectively. **Solar companies can leverage the momentum behind mobile money to offer consumers a more convenient way to buy off-grid solar products.**
- Private sector mini-grid development is limited because the Government of Ghana has historically prioritized government-owned electricity infrastructure and existing regulatory structures provide no explicit frameworks for mini-grid development. **However, regulations for private mini-grid development were drafted in 2017 and could provide a robust framework to address common issues including land rights, grid encroachment, quality standards, and tariff structures.**



ON-GRID AND OFF-GRID ELECTRIFICATION

Actual access rate vs. electrification target



Main provider of electricity. Ghana's on-grid electricity sector is unbundled across several government-owned companies and private independent power producers (IPPs). State-owned entities dominate power generation, including Volta River Authority (2,600 MW) and Bui Power (400 MW). IPPs operate an additional 1,700 MW of thermal capacity and 40 MW of solar power. Transmission and distribution are split between GRIDCo, Power Distribution Services, and the Northern Electricity Distribution Company.



Plan to increase electricity access. The National Electrification Scheme (NES) guides Ghana's current energy access agenda. The NES outlines a grid extension policy designed to realize universal access by 2020 (which has since changed to 2025). Rather than a single roadmap, the NES comprises various financing mechanisms, five-year electrification plans, and programming. Off-grid electrification planning is embedded in the REMP, which sets deployment targets for standalone solar systems, lanterns, and mini-grids.



Constraints to rural electrical grid extension. Companies in Ghana may struggle to reach remote off-grid customers due to difficulties with last-mile distribution, including uncertain grid connection status, poor mobile coverage, underdeveloped transportation infrastructure, and sales agent capacity and retention. Additionally, because of the high rate of electrification, the only remaining customers are the hardest and most costly to reach.

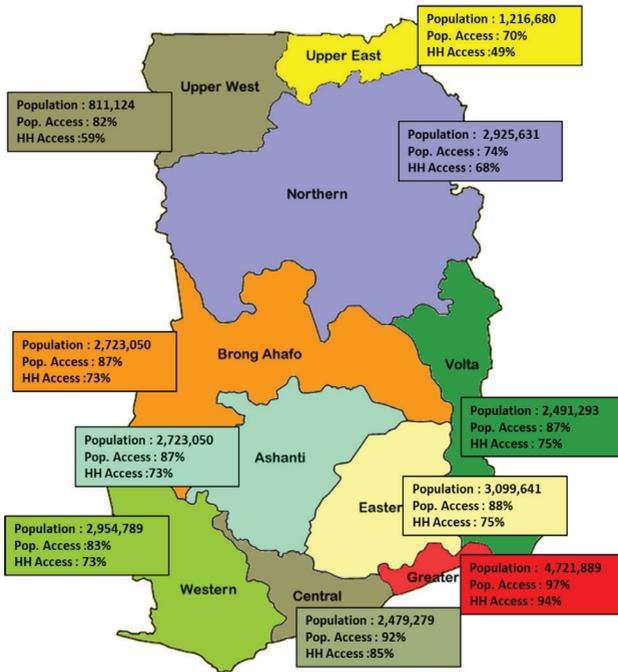


Policy and regulation. Ghana's energy sector is organized around the Ministry of Energy. One sub-entity is the Renewable Electrification Unit, responsible for developing on- and off-grid electrification programs. A second is the Distribution Directorate, which focuses on grid extension but also participates in off-grid electrification programs. The Energy Commission (EC), Ghana's energy regulatory body, licenses renewable energy supply and installation companies, under which solar home system (SHS) companies are categorized.



Associations. In Ghana, the Association of Ghana Solar Industries (AGSI) focuses exclusively on solar, and the Renewable Energy Association of Ghana covers a range of renewable technologies. AGSI has 46 members, ranging from solar suppliers and EPCs to small-scale installers and SHS distributors, and supports the industry through government advocacy, technical training, and collaboration with donors.

Energy access map of Ghana, 2019



KEY STATISTICS	
GDP	\$65.56 billion
GDP growth potential	6.7% per year
Population size	29.9 million
Population density	126.18 people per km²
Population growth rate	2.2%
Household size	4.1
Rate of urbanization	3.07%
Urban Rural population	Urban: 55.3% Rural: 44.7%
Languages	English, Asante, Ewe, Fante, others



SHS AND PICO-SOLAR

As one of the earliest West African markets for SHS, Ghana is home to both international and local SHS companies spanning a range of established to early-stage enterprises. There is growing interest from major international players, such as Mobisol, Jabo, BioLite, and EcoZoom, to enter the Ghanaian market via local partnerships. Such developments have the potential to increase competition and mobilize resources, distribution strategies, and payment models necessary to reach toward last-mile communities.

Consumer Finance. Microfinance institutions (MFIs), rural banks, or village savings and loans associations (VSLAs) are active in consumer financing of off-grid solar products. Ghana has 144 licensed rural banks, several of which offer consumer credit for products but not specifically off-grid systems. MFIs, such as Opportunity International and Snapi Aba Savings and Loans, are exploring SHS company partnerships. One example of a VSLA–SHS partnership is Sunhut–Villageboom’s collaboration with the VSLA Resilience for the Northern Region of Ghana to offer energy products to women’s groups.

Commercial Finance. Ghana’s commercial banking sector does not actively lend to off-grid energy companies. The banks involved in the country’s renewable energy sector include Stanbic Bank, Ecobank Ghana, Fidelity Bank, and CalBank. Even in these cases, loans have high-interest rates and short tenors. Several donors have developed local credit facilities that are, in theory, applicable to off-grid energy companies. These facilities include a \$10-million clean-energy-guarantee facility through the USAID Development Credit Authority (DCA), Ecobank, and the Rural Development Fund. These facilities, however, are not explicitly designed for off-grid energy companies and have not been accessed by the off-grid sector. In fact, a DCA guarantee has never been used for a loan transaction in Ghana’s energy sector.

MINI-GRID

The Government of Ghana (GoG) views mini-grid development as top-down and government-driven. According to official policy, the government must own mini-grids, and private participation must be limited to an EPC (engineering, procurement, and construction) role. From a national and regional planning standpoint, off-grid energy development is mainly relegated to the island and lakeside villages around Lake Volta.

Public. The REMP sets out the GoG’s high-level mini-grid development targets with the goal of commissioning 86 by 2020 and 300 by 2030. Donor support has been critical to this top-down approach, and donors fund the bulk of the current mini-grid pipeline.

Private. The country’s only private operator of multiple mini-grids is Black Star Energy, which operates 17 mini-grids serving approximately 6,000 customers in the Ashanti and Brong-Ahafo Regions. Black Star Energy’s sites are the first to be privately licensed in Ghana, despite the fact that the EC does not have an official licensing framework for private mini-grids. The company was able to obtain a modified installation and maintenance license for an early site after submitting technical designs. Black Star Energy focuses on communities with at least 100 households, and typical system capacity is approximately eight kW. Tariffs are approximately \$0.23 (1.33 in Ghanaian cedis) per kilowatt hour, and their cost per connection is approximately \$500. Black Star Energy gets funding mainly through impact equity investments, crowdfunding debt, and grants, such as the EDF Pulse Africa Award.



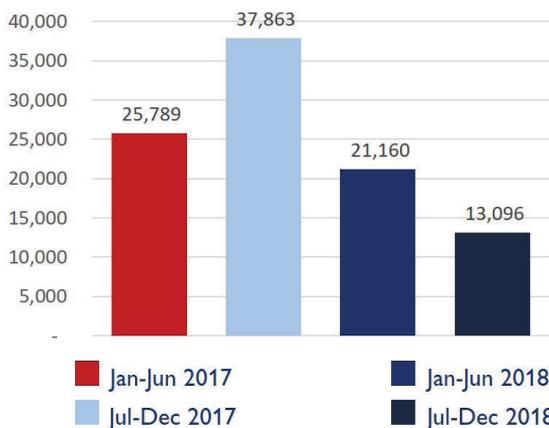
MARKET INTELLIGENCE USING GOGLA DATA

Sales and investment data from the Global Off-Grid Lighting Association (GOGLA) provide details on the off-grid solar sector in Ghana. Despite Ghana's high electrification rate relative to other countries in sub-Saharan Africa, GOGLA estimates that SHS products have penetrated 19% of the off-grid market, suggesting that plenty of customers remain to be served. Following a slight drop in sales from the latter half of 2016 (38,496) to early 2017, sales rose again for 2017's second half (37,863). It is possible the drop in sales throughout 2018 is due to saturation of the market, and off-grid companies have already reached the customers that are easiest to reach.

Pay-as-you-go (PAYGO) products contributed to an average of about 50% of all sales in Ghana during each half of 2018, despite a 50-percent drop in overall sales from the first to the second half of the year. These data suggest that demand has dropped across market segments, regardless of affordability constraints.

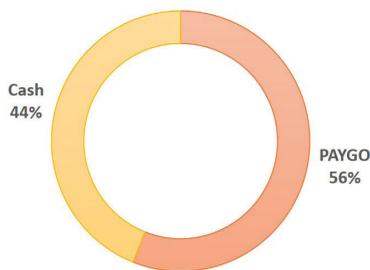
Sales of pico/SHS units

Jan 2017 - Dec 2018



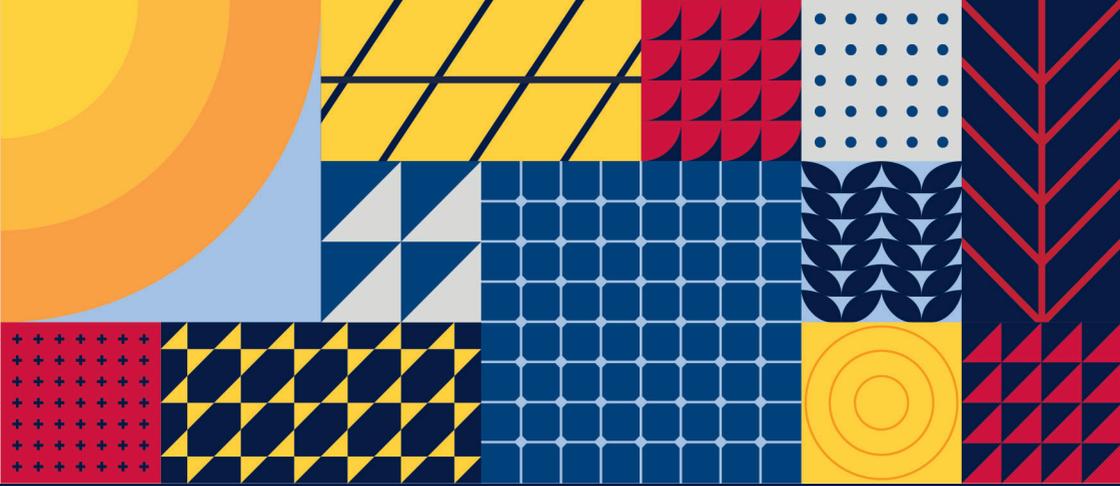
Sales by business model

Jul-Dec 2018



In West Africa, broadly, 2018 was a positive year for fundraising for the off-grid solar sector, as invested amounts continued to rise precipitously compared with previous years. The year witnessed growth primarily in equity (\$61 million), while debt transactions lagged substantially (\$4 million). There was an enormous flow of funding to West Africa in 2016, which may explain the acceleration of sales in 2017. Of this \$107.4 million in funding, 55% was from the government funding and 45% was for-profit financing. For-profit financing soared in 2018 to \$60.1 million (89% of all 2018 funding), indicating that private investors see potential in the West African 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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